AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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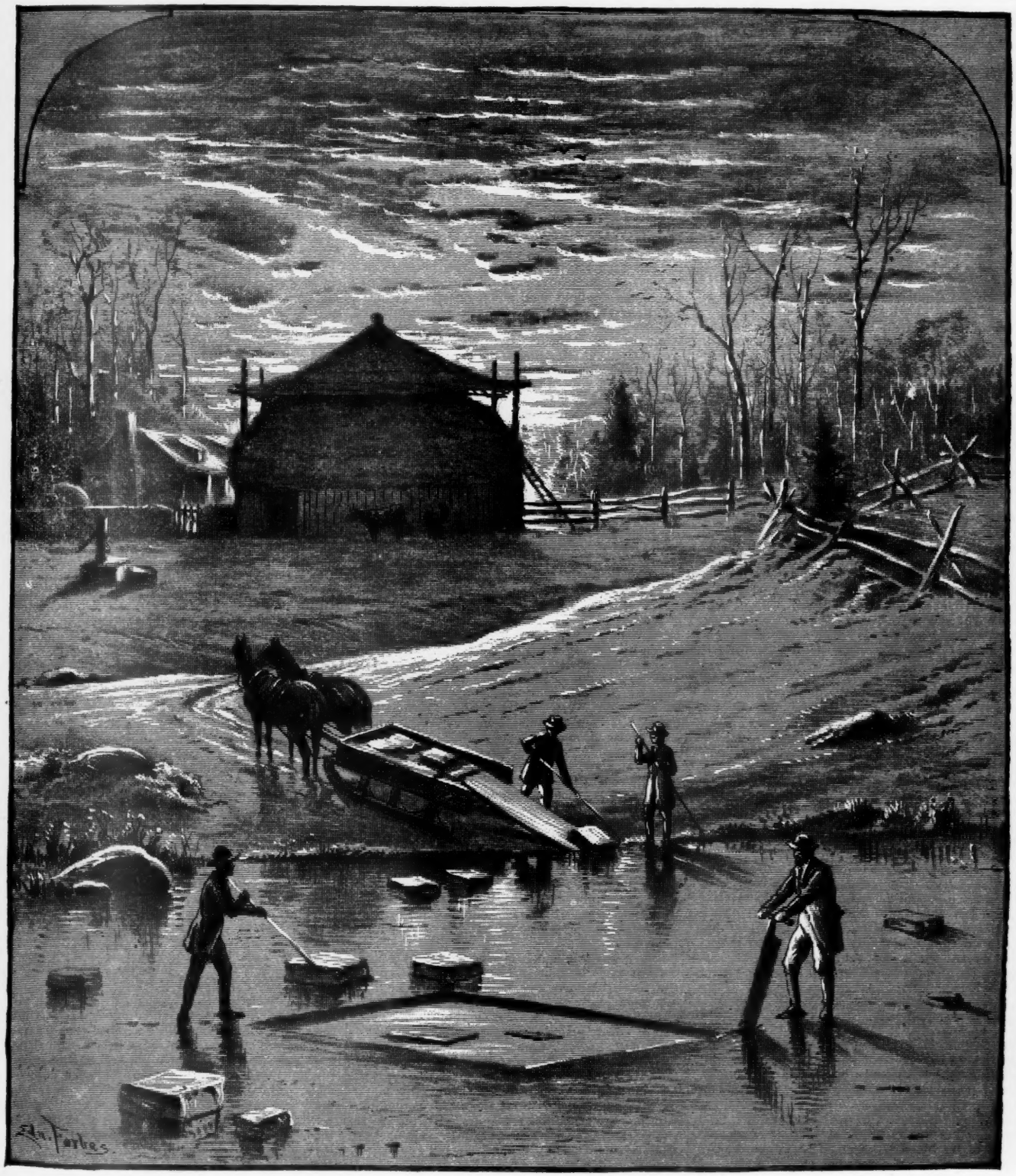

THE FIRST HARVEST OF THE YEAR.

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January.

E'en while he sings, he smiles his last,
And leaves our sphere behind;
The good old year is with the past,
Oh! be the new as kind!
WILLIAM CULLEN BRYANT.

FARM · AND · GARDEN · WORK
JANUARY, 1889.

One of the favorite deities of the ancient Romans was *Janus* from whom the present month is named. Janus was represented with two faces; one of them turned toward the past, and the other gazing into the future. Every successful farmer will be found to be like Janus in looking thoughtfully into both the past and the future. He must be a dull and unthrifty farmer, indeed, to whom the seasons as they pass bring no useful lessons for the future. We have often advised keeping a farm record, in which should be entered the principal events of the farm—the date of sowing the principal crops, the date of purchase of different animals and when others were dropped, the time of unusual changes of the weather, the particulars concerning hired help, etc. What would one not give for a file of yearly records of this kind, covering the period from his first year as a farmer? The past is gone but you can begin one now, with this first of January. The habit of making daily entries will soon become fixed and it will cease to be a task. If the farmer is too busy, let his son or daughter do this for him. It will be a most useful duty for the young folks.

The Manure Question.—Of great importance at this season is the manure crop. Every shovelful should be saved and go to the heap, not only for the sake of clean and healthful stables, but for the intrinsic value of the manure. Keep all manure piles well made and compact. If too hot (which may be learned by running a stick into the interior) make the pile anew, bringing what was in the center to the outside. Some good, artificial fertilizers will generally pay to use together with yard manure. Look into the merits of these while there is leisure. Send for the catalogues advertised in the AMERICAN AGRICULTURIST.

Fire-Wood.—Cut a good supply and allow it to be well seasoned. The woman who can cook with green wood, and be pleasant with it, must be but a little lower than the angels.

Make an Inventory.—Make a list of everything you own from the family carriage down to the shoe-brush. Put down everything you owe in this account of stock, as the first step in keeping farm accounts.

Live Stock Notes.

Horses are in danger of suffering for want of sufficient exercise during the inclement days of winter. This is specially applicable to stallions, brood mares and unbroken colts. They should have several hours of exercise in the fresh air every day. The great breeding stables in England and many in this country have extensive covered areas for exercise, but a clean, well-fenced barnyard, with a shed across one side will do very well for colts. Moderate work is far better than idleness for brood mares and stallions in winter.

Cows are liable to severe accidents if compelled to tramp over icy paths to water, or if ice is allowed to accumulate around the watering trough in the yard. There is no room for question about the economy of taking the extreme chill from the drinking water for stock. Yet there are few farmers who will take the trouble, and the least they can do is to see that the chilly watering places are not rendered inaccessible by ice blockades.

Ensilage made from corn is not a well-balanced food. It is rich in the elements of fat and heat, but lacks muscle formers, and should be supplemented by bran, clover hay, or oil cake.

Brood Sows and Boars should not be fed heavily on corn or meal.

Pig-pens which stand high on posts, with an open space beneath the floor, are cold places in winter, despite straw bedding. It saves feed and adds to the health and comfort of the pigs to "bank up" such pens or otherwise keep the winds from whistling under them and through the floors.

Poultry need a good, dry dusting place. They like it better on a level with the floor of the poultry house than to climb into a box. Overfeeding or keeping on corn and other fattening food is quite as frequent a cause for hens failing to lay as lack of food.

Orchard and Fruit Garden.

The orchardist will find the hours which are spent in thinking over the experiences of the past, and planning for the future, during the winter and by the fireside, quite as profitable as those spent in actual labor in the orchard. Is everything in proper order for winter? If not, though late, take advantage of a mild spell and make all snug. See that fences are all right. When horses and other live stock are allowed to run at large, a strand of wire at the top of the fence will prevent the horses from leaping it. If allowed to get among young trees, they will do much damage by browsing at their tops. Young trees should have had a mound of earth heaped against their trunks, both to steady them against heavy winds and to protect them against mice. If this has been omitted, tramping the snow firmly around the trees will keep off the mice. Repeat this after each snow fall, for if this is not done, the mice will work under the cover of the light snow and gnaw the bark, often disastrously. Rabbits are in some places more mischievous than mice, and girdle the trees often beyond remedy. Where there are boys they can, by setting traps or by the use of a shot gun, keep the rabbits quite scarce. It is a singular prejudice that many persons have against the use of rabbits as food. Farmers deprive themselves of what many regard as a luxury, because of this prejudice. Rabbits are very dainty animals, and are kept from attacking the bark of young trees by smearing them with blood or liver, or other bloody meat. It is said that clay mixed with water thin enough to apply with a brush, and some tincture of asafetida added, will, if painted on the trunk, keep the rabbits away from the bark. In trying the tincture of asafetida, go to a wholesale store and buy it by the pint. Or the gum asafetida may be bought by the ounce, broken small with a hammer, and an ounce added to a pint of whisky, or preferably, as much alcohol. In a few days, with occasional shaking, it will be ready for use. Have the bottle well stoppered, as a scattering of the contents, when shaking, may not be pleasant.

Kitchen and Market Garden.

This is the month in which less outdoor work can be done than any other. The chief occupation will be caring for the crops that have been stored for the winter.

Cold Frames, in which plants are stored for the earliest crops of cabbages, cauliflower, etc., need frequent attention. The plants should be kept in a dormant state. If too warm, they will start into growth. In moderate weather ventilate the frames, and in severe spells cover the sashes with mats. We usually have a "January thaw," in which the weather is warm and spring-like for a week or more. At this time, take care that the plants in the cold frames do not get excited into growth.

Manure is the key to all successful gardening, whether the crops are for home consumption or the market. The good gardener may be judged by the size of his manure pile. We have known a market gardener to take in a lot of horses to board at a low rate for the sake of the manure supply which they left him.

Forest Leaves.—Fortunate is he who gathered an abundant store; there is no better material for bedding the animals, and when mixed with the liquid and solids from the animals it makes an addition to the compost heap, which soon decays into the richest manure, quite free from seeds.

Hot-beds.—In most northern localities hot-beds will not be started until next month. In the Southern States they will be made now. Though the plants start early in the open air, yet the residents like to have their vegetables earlier as much as do those who live in a cold climate. See that the materials for frames are ready, and the sashes in good order to be used when they shall be needed. For heating material, pure horse manure is often advised, but this sometimes gets beyond control. It is much better to use leaves in the proportion of one-third to one-half of the stable manure. With this the heat comes up gradually and the mass is more under control and more lasting than when manure alone is used.

Seeds.—Overhaul the store on hand and throw away all of doubtful vitality. There are but few seeds that are not good at the end of two years, while the average are good at the end of four or five, and squashes, melons, and all of that family, last almost indefinitely. Onions, parsnips and carrots are the seeds which growers are most particular about. Those who supply the market with crops should put their dependence on varieties known to be marketable, and not risk novelties until a trial has proved their value.

Greenhouse and Window Plants.

A sudden fall of temperature during the night cannot be foreseen, and it is well to consider what should be done in an emergency. Sprinkling water upon the pipes is one of the most ready means of raising the temperature. Plants in windows upon anticipation of a very cold night may be removed to the middle of the room, or an arrangement may be made for hanging over the plants. A screen of light cloth or paper to be put over the plants while the room is being swept, will aid greatly in keeping them free of dust. The health of evergreen plants is much promoted by giving a weekly showering, placing the window plants in the bath tub. Plants too heavy to move, or that are suspended, like ivy, should have their leaves washed simply with a soft cloth and warm water.

Insects.—It is seldom convenient to smoke house plants, and tobacco water may be used for insects instead, standing the pots in the bath tub, or a spacious sink. Pour boiling water upon cheap tobacco, dilute it to the color of weak tea. Lay the pots upon their sides in order that the under surface of the leaves may be reached. Frequent drenching with water only will keep red spiders in subjection.

Bulbs that were potted last fall should be well rooted by this time, and should be brought into light, and given water, and they will soon be in bloom. Give the plants ventilation whenever the outside weather will allow. Window plants may be given air by opening the windows of an adjoining room.

Pots of Annuals make a fine decoration for the window or greenhouse, and now is the time to sow the seeds. Nemophila, or "Love-Grove," with its abundance of light-blue flowers, is one of the best, as it likes a shady place. Candytuft, Sweet Alyssum, and Mignonette, are useful for cutting. The Canary bird flower is an annual climber, and useful to train up the window from the inside, or later, upon the outside, and to trail over the balcony.

Propagation.—In the greenhouse propagate from cuttings and by seeds such plants as will be needed for the garden in spring. Look out for sudden and sharp changes of weather.

Flower Garden and Lawn.

Daniel Webster was frequently the subject of abuse by a blackguard. When asked why he did not retort to the fellow, he remarked that he did not shovel off his sidewalk until it had done snowing. So with the snow plow; it is such great fun for the youngsters that there is every inducement to start out the plow before the snow-fall is over, and the work has to be done over again. Every farmer should have a snow plow for the roads, to be drawn by horse, and one for the paths, by hand power.

Repairs.—If any trees, especially evergreens, have been broken by the storms of winter, make a smooth cut of the wound and paint it over. Some of the heaviest snow-falls often come late this month or next. Shake the snow out of the evergreens. If new beds, walks, etc., are to be made, plan them in advance.

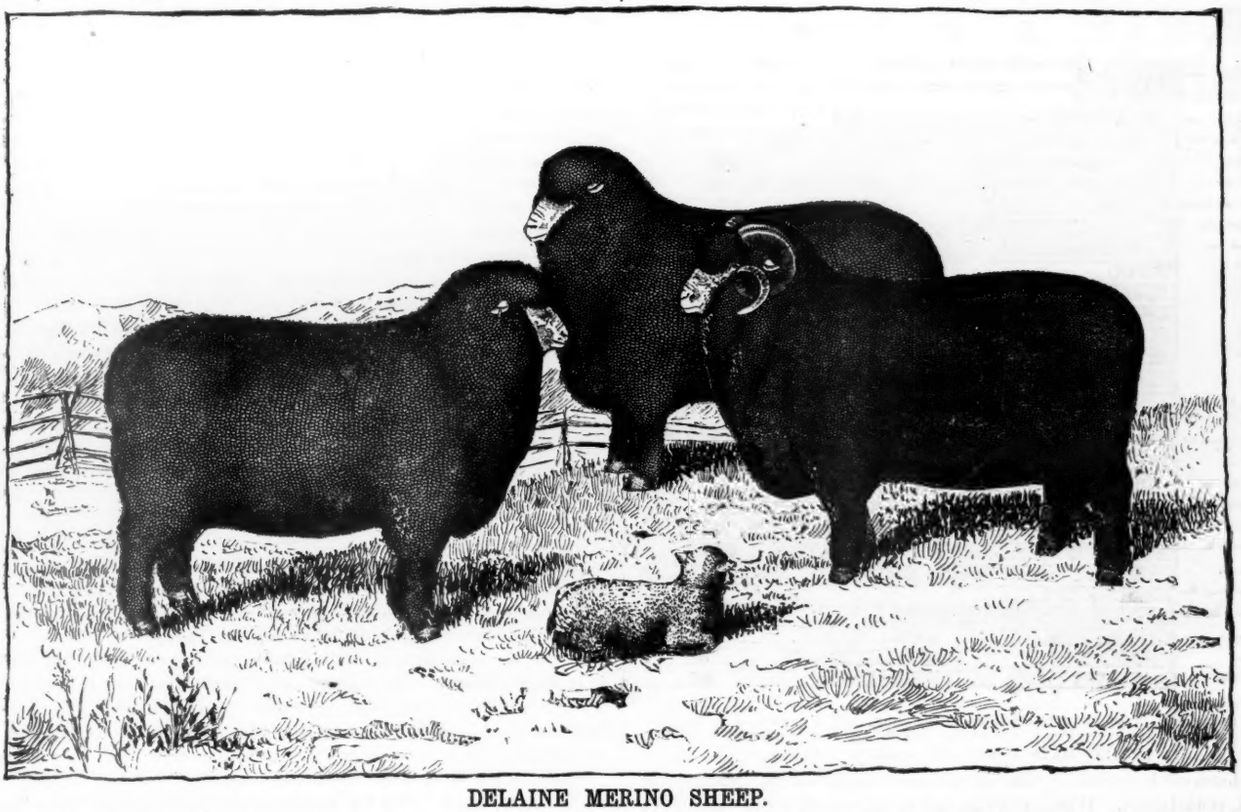
AMERICAN DELAINE MERINO SHEEP.

Washington County, Pa., is the head-quarters of a class of sheep which are popularly known in that region as "The Big Merinoes." The class comprises no less than four distinct strains, the "American Delaine Merinoes," the "Black-top Merinoes," the "Dickinson Merinoes," and the "Improved Saxony." All are similar in size, freedom from wrinkles, and general character of wool, but each strain is bred in its own distinct line. The first three were originally bred from Spanish Merinoes and the last named is the result of crosses between Spanish and Saxon. That all are pure-bred Merinoes has never been questioned, yet they have always been regarded by Spanish Merino breeders with something of the distrust which Shorthorn cattle breeders have for the "Seventeens." While willing to concede them points of high individual excellence, some of the Spanish Merino breeders have doubted the purity of their blood. Stephen Powers, in his "History of the American Merino, says: "For some reason a cloud has always rested over importations made subsequently to 1812." These "big Merinoes" trace to the Meade importation of 1820. We shall soon show how groundless are any prejudices against them.

The American Delaine Merinoes, of which a typical group is shown in the accompanying illustration, trace to a flock of Spanish Merinoes, imported about 1820, by Richard W. Meade, United States Consul in Spain, and father of the late Gen. George G. Meade. They were taken to Washington County, Pa., and crossed with others imported about the same date by J. R. Dickinson, and an occasional infusion of fresh blood from Vermont and other flocks. They were known as Black-top Merinoes, from the copious secretion of yolk. From 1862 to 1867 two bucks bred from crossing Spanish Merino with Black-top, and purchased of C. H. Beall, of West Virginia, were used in one of the flocks in Washington County, Pa. In 1871 a Spanish Merino ram named Victor, of great individual merit, was brought into the flocks of two leading breeders and left his impress upon both. His fleece was remarkably heavy, weighing twenty pounds, very white, and while sufficiently oily was free from any excessive secretion. He left his impress on the flocks, which were still further improved. The progeny of these sheep and others bred on similar lines were kept entirely distinct from the Black-tops and called Victor-Beall Delaine Merinoes. In 1887 this name was changed to the more comprehensive one of American Delaine Merinoes.

These sheep have been brought up to the present standard by careful selection and breeding from Spanish Merinoes, with a view to producing "more wool and more mutton on fewer legs." For record in the National Delaine Merino Register, rams are required to weigh not less than one hundred and fifty pounds, at maturity, and ewes not less than one hundred pounds. The scale is based upon the following points: Body—good constitution; heavy around the heart; short heavy neck; good dewlap; broad back; well sprung ribs; short legs; heavy bone; small sharp hoof. Fleece—length of staple, one year old, three inches; dense; darkish cast on top, opening up white; good flow of white oil; good crimp in staple. The fleece is required to be uniform in length all over the body, belly and limbs to the knees, and cover the face square to the eyes; of smooth, uniform surface, dark, but not black and crusty on top, which will not dissolve in washing.

As will be seen by the description and the portraits which are from life, the sheep of this breed are compact and massive in form, without wrinkles, and carry a heavy, uniform fleece of fine crimpy wool, with natural secretion of white, well-distributed oil, sufficient to protect them from wet, but not to form a dense black crust. The staple is of combing length and quality, from which textile fabrics are made fine enough for ladies' dress goods. Fleeces weigh from ten pounds upward. The mutton is claimed to be of good quality. Whether it can compete successfully in the markets with the juicy and finely marbled flesh of the English Down breeds is a point upon which there is room for question.



DELAINE MERINO SHEEP.

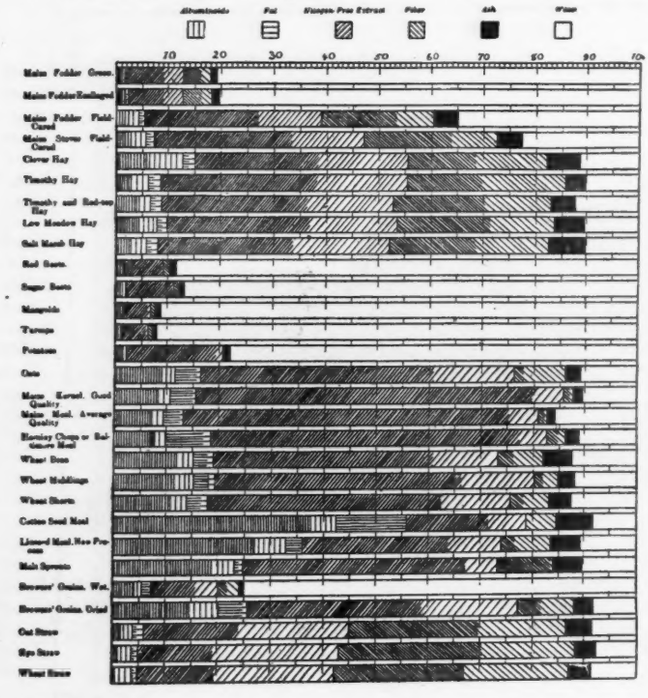
The first volume of the Register of this breed was issued in 1882, the second in 1885, and the third in 1888. The membership of the association is mostly located in Washington County, Pa., with a few members in Ohio, West Virginia and Iowa. W. R. Craighead, Cannonsburg, Pa., is president, and John McNary, Houstonville, secretary of the association. The members are intelligent, enterprising breeders, who are successfully maintaining the standard of this truly American breed.

Successful Treatment of Garget.—In earlier life I treated garget by a number of methods with varied success, pus forming in only a few instances; but for twenty-five years I have had no case of suppuration of the udder from garget. As soon as the trouble is discovered (usually but one quarter of the udder, more correctly one of the four glands is involved), the inflamed part should be bathed with a mixture of equal parts of tincture of lobelia and glycerine and kept saturated with it till fever, tenderness and swelling subside. If pus has been already formed, the pus sack should be opened at its lowest point and kept dressed with a weak solution of phenol, thymo-cresol, or listerine. DR. D. L. PHARES.

COMPOSITION AND DIGESTIBILITY OF FEEDING STUFFS.

E. H. JENKINS, PH. D.

The aim of the table which accompanies this article is to show by a graphic method what quantities of food ingredients our common feeding stuffs contain and, along with this, what portion of each food ingredient is actually digestible, and so has real food value. The food ingredients contained in any cattle food are grouped as albuminoids, fat, nitrogen-free extract, fiber, ash and water. The *albuminoids*, or flesh formers as they have been called, include all the nitrogenous matters of feeds. These substances in composition and properties are like the white of egg, the curd of milk or the fiber of lean meat. The albuminoids are the most valuable and costly group of food ingredients. *Fat* includes everything which is soluble in ether, like the oil of cotton and linseed meal, besides other less liquid fats, the wax which covers the skins of some fruits, resins, volatile and fragrant oils, etc., and sometimes, as in ensilage, acids produced by fermentation of the feed. *Nitrogen-free extract* includes the greatest variety of things —starch, as in corn meal, sugar as in the sugar beet, gums, pectin or jelly-forming bodies, and many other things less known than those named. *Fiber* is the cell tissue of the plant, either cellulose as in the cotton fiber or lignin as in wood. *Ash* is whatever will



[The part of each of the first four elements that is digestible is indicated by the close shading; the more open lines show the proportion that is not digested.]

APPROXIMATE VALUE OF VARIOUS STUFFS.

not burn off by roasting, that is, mineral matter—lime, phosphoric acid, potash, etc. *Water* is what can be driven off from the fodder by drying it at 212° Fahr.

A discussion of the uses which these various ingredients serve in the animal body would take us beyond the possible limits of this article. Information of this kind can be found in the standard books on feeding and in the current literature of our experiment stations. It is enough to say here that all these ingredients are necessary in a cattle ration—some would regard water as an exception—and the skill of the feeder consists in making up a ration which shall supply enough of each of them in digestible form, which shall avoid wasteful excess of any one of them and which shall be acceptable to cattle.

The table shows the average quantities of albuminoids, fat, nitrogen-free extract, fiber, ash and water which have been found by analysis in all our common feeding stuffs. Each band in the table represents one hundred pounds or one hundred per cent of the feed named in the margin on the left. The proportional quantity of each food ingredient which makes up this one hundred pounds is shown in the way indicated above the plate. Thus the massed perpendicular lines denote albuminoids; horizontal lines, fat; oblique lines, running downward toward the left, denote nitrogen-free extract; while oblique lines running downward toward the right denote fiber. Mineral matter or ash is printed solid black and water has no marking at all. These statements of composition are derived wholly from analyses made in this country, chiefly at our agricultural colleges and experiment stations, and are taken from the tables annually published by the Connecticut Experiment Station.

A glance at the table shows the general make-up of any given feed stuff as correctly and more quickly than a numerical statement of per cents would show it. And this in many cases is all that is wanted. But if the precise figures are required, they may readily be read off on the scale at the top of the plate. A single division represents one pound in one hundred or one per cent. A pair of dividers or a fine rule will be a great help in this measurement.

In the second place, the table shows what part of each of the food ingredients is digestible. No feeding stuff is wholly digestible. None contains nutriment and nothing else. A certain part of any feed passes through the animal unchanged and does it no good. The quantity of this indigestible and useless matter is quite different in different feeds. For instance, nearly nine-tenths of the albuminoids of cotton seed meal are digestible, while of the albuminoids in hay of poor quality only about one-half are digestible. It has been usual to state the percentage digestibility of the food ingredients of different feeding stuffs in a separate table, thus making it necessary for each reader to perform a series of multiplications to get at the actual quantity of digestible matter, that is of real nutriment, which is in any given feed. This work has been already done in the chart and is presented to the eye in a striking way as follows: A portion on the left side of each space representing either albuminoids, fat, nitrogen-free extract or fiber is darker shaded than the rest of the space. This shaded portion indicates both the proportion and the real quantity of the food ingredient which is digestible. To illustrate, cotton seed meal has 42.4 per cent (or pounds in the hundred) of albuminoids, but the table shows that 37.6 pounds only are digestible and have feeding value. Only a few digestion experiments have been made in this country yet, so that the figures for digestibility given by German authorities have necessarily been used in most cases. The results of American observation have been used so far as they were available.

It must be understood that this table represents averages; it is a general statement. All feeds vary more or less—some of them widely—in composition according to differences of soil, climate and season in which they were grown. Animals, too, differ considerably in their powers of assimilating food. Still the table is valuable in presenting to the eye at a glance a comparative statement of the average composition and nutritive value of our feeds.

APOPLEXY IN SWINE.

Apoplexy is usually a disease of fat hogs, although an animal that has long been thin or suffering from excessive irritation of the intestinal canal would also be predisposed to it. It must be understood that the process of fattening an animal in a few weeks destroys the equilibrium of the system, and in one sense the fatness is in itself disease. The storing up of fat in the animal economy is always at the expense of muscular development. The muscles become weak and flabby. All the blood-vessels of the system are surrounded by a strong, tough, muscular coat that in a state of perfect health will resist any force that the heart's action can put upon these canals. But the fattening process weakens these fibers; a sudden or unusual strain ruptures one in the brain, and we call it apoplexy. It is not as common in the hog as one would expect, but occurs so often that the breeder should understand it and know the right thing to do. It is impossible to foresee when this is going to occur. If the rupture is a very small one, when the blood is oozing out in tiny drops, the hog will sometimes be found lying insensible and breathing heavily. No effort will arouse it. It is more usual to find a big fat hog lying dead, with no external marks or signs of the cause of death. Cut open the skull carefully, and a clot of blood of greater or less extent will be found inside. If alive, however, tie a stout cord above the knee and with a stick take a twist in the cord until on the inner side of the leg below the knee the brachial vein can be felt. Open it with a sharp-pointed knife, and if the blood will run take a pint and a half or a quart. Don't guess at it. An ounce of blood spread over the ground or on the floor has been mistaken for a pint. If the bleeding is to do any good, there must be considerable taken. If the broken vein is a small one, and the case is observed soon after it occurred, the animal may be saved. If it partially revives it will be proper to evacuate the bowels. A large stock syringe would be valuable here to throw up a quart of warm water. In most cases, however, the owner will have a chance to sell the animal for soap-fat.

CO-OPERATIVE CREAMERIES IN NEW ENGLAND.

BY ONE WHO HAS EXPERIENCED THEIR BENEFITS.

Quite a different plan of creamery management is in vogue in New England from the Dakota system described in recent issues of the AMERICAN AGRICULTURIST. Instead of seeking for a proprietor to buy and operate the factory, the New England dairymen insist on having it managed co-operatively. The company is organized on a co-operative basis, each shareholder (the shares are usually $25) having as many votes as shares, and the number of shares one person can hold is limited, so as to have the stock in the hands of as many farmers as possible. This makes them all interested in the creamery's success. The stockholders elect a board of directors, who run the business by means of a business manager or superintendent and butter maker, with such assistance as may be required. After paying the actual running expenses, and usually laying aside a quarter of a cent per pound additional with which to create a reserve fund to meet extra expenses, the entire balance of the receipts is paid to the patrons. The expenses include five or six per cent per annum on the investment in the factory, but this is the only financial advantage the patrons who are stockholders enjoy over those who are not share owners. The capital required varies from $2,000 to $4,000, about $3,000 being the average capital of our co-operative creamery companies. Where the site is given and much of the work of construction and grading is voluntary, the expense of starting is less. These creameries have been so successful as to multiply rapidly during the past half dozen years, until there are about one hundred and fifty where there were none eight years ago. When the conservative nature of the NewEngland farmer is remembered, it will be seen that associated dairying must have survived severe tests to come into such general use and increasing popularity. It is not too much to say that the system is fast revolutionizing New England dairying.

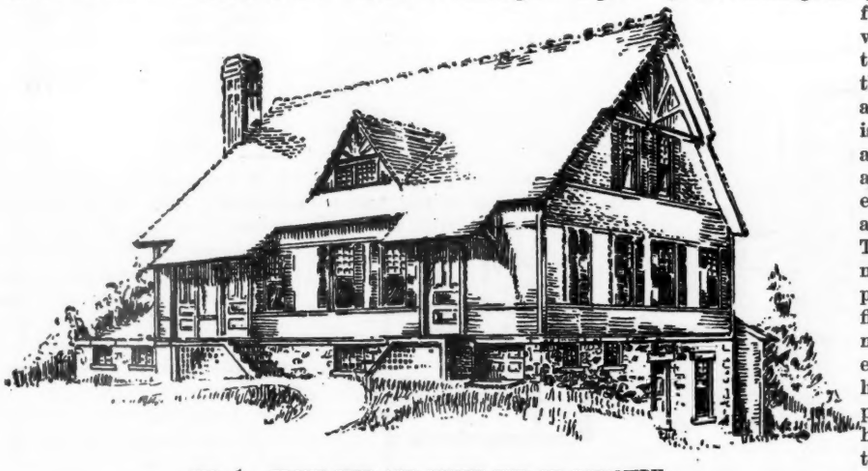


FIG. 1. FRONT SIDE AND NORTH END OF CREAMERY.

FIG 2. SOUTH END AND WEST SIDE OF CREAMERY.

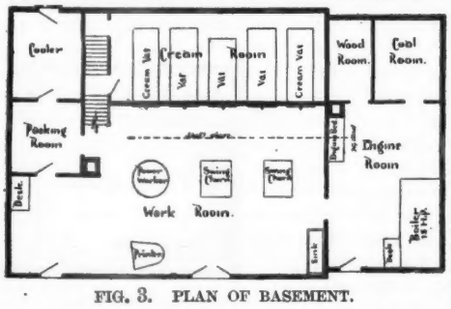


FIG. 3. PLAN OF BASEMENT.

The Amherst co-operative creamery, whose factory is located in Hampshire county, Mass., is an excellent type of these institutions. It started in 1882, amid the distrust and disadvantages common to any undertaking wholly new to farmers who have had no experience in co-operation. The original capital was $3,000, which built and equipped an excellent factory, but after several years difficulty was experienced in securing perfect drainage, and it became necessary to build a new factory, which is illustrated herewith. This change has involved considerable extra expense, and is an exceedingly valuable object lesson to all creameries. Absolutely perfect drainage and pure water are the first requisites to a successful butter factory. Each patron is supplied with a Cooley creamer, the water in which has to be kept at a certain temperature, so that as the milk is submerged (that is, the can, cover and all, is entirely under water) all the cream is raised under essentially the same conditions and is practically equal in quality. This does away with the great inequalities that would exist if the milk were set in a variety of cans, and makes all feel that they are equally paid. To preserve the proper temperature in summer, ice is used in the creamers, so that every patron must have an ice-house. This was at first regarded as a hardship, but after one summer's experience with plenty of ice no farmer's family will be without it. The creamery has been a blessing by compelling farmers to provide ice, as well as by wholly relieving the household of the drudgery of butter making, to say nothing of the work of marketing, low prices, "store-pay," a poor product, and all the disadvantages of butter making on the average farm.

The cream-gatherer from the factory goes his rounds daily (sometimes only three times a week in bad winter weather, the patrons being allowed to skim the alternate days, and keep the cream submerged until the gatherers call for it), skimming the cream from the cans, so that all the farmer has to do is to milk his cows, strain the milk into the cans and wash them after the cream-gatherer has departed; all the rest of the labor is performed at the factory. When the gatherer arrives at the creamery, he unloads his cans on the rear platform. They are carried into the receiving room and the contents poured through strainers into the cream tempering vats below. These vats and the room in which they are placed are so constructed as to preserve any desired temperature, as even and uniform ripening of the cream is essential to the best product. Cream can be drawn directly to the churn, and the buttermilk from the same runs from the churn by a sewer of glazed Akron tile into the buttermilk tank twenty-five rods distant, from which it is drawn off by the farmer who buys it to feed to hogs or hens. Another long drain carries off the wash-water, while the boiler furnishes hot water and the engine

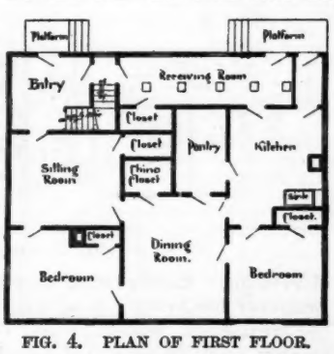


FIG. 4. PLAN OF FIRST FLOOR.

does all the pumping. The butter is put up almost wholly in pound prints, and sells in the neighboring markets, comparatively little surplus being tubbed and shipped to New York or Boston. Five cream-gatherers, a superintendent who is also chief butter maker and who has one and much of the time two assistants, and a treasurer who keeps the accounts, constitute the working force employed

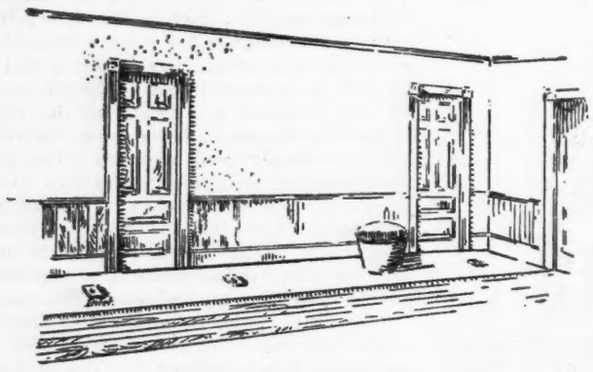


FIG. 5. RECEIVING ROOM.

in the business of converting into cash the cream that makes eight hundred to fifteen hundred pounds of butter per day. The cream is all gathered within a radius of six miles from the factory, the longest cream route being about twenty miles for the round trip. An idea of just what is accomplished is best given by the following statement of

THE BUSINESS DONE FOR THE PAST SIX YEARS.

THE PRODUCT.	*1888	1887	1886	1885	1884	1883
Spaces of cream received	1,766,168	1,652,639	1,383,533	1,037,606	616,440	399,324
Pounds of butter made	271,103	254,894	215,788	160,004	97,159	6,776
Spaces cream to make 1 lb butter	6.46	6.47	6.47	6.30	6.31	6.36
THE RECEIPTS.						
Received for butter	$74,898	$69,339	$53,566	$43,589	$32,436	$18,496
Received for cream	155	144	132	183	479	376
Received for buttermilk	480	492	334	399	450	393
Total sales	$75,553	$69,974	$58,957	$44,171	$33,365	$19,265
Receipts per pound (cents.)	28 cts	27.45 cts	27.88 cts	28.48 cts	30.67 c	30.54 c
THE EXPENSES.						
Total expenses	$12,928	$11,208	$9,054	$7,128	$4,447	$2,840
Expenses per lb. butter (cents)	4.4 cts	4.40 cts	4.22 cts	4.41 cts	4.68 c	4.59 c
THE PAYMENTS.						
†Amount paid patrons	$62,645	$58,766	$49,878	$37,043	$28,918	$16,426
†Average payment per space of cream (cents.)	3.63 cts	3.55 cts	3.64 cts	3.82 cts	4.10 c	4.09 c
†Average payment per lb. of butter (cents.)	23.60	23.05	23.66	24.07	25.99	25.95
Average number of patrons	172	165	152	120	80	49

The steady increase in the business done shows how well the factory has satisfied the co-operators. It is also evidence that the patrons have cheerfully complied with the regulations as to feeding of cows and caring for the stock, stables, creamers, etc., for without this essential co-operation the product would have fallen off in quality—the beginning of misfortune. First-class butter makers, intelligent marketing and accurate keeping of accounts have also been inseparable in the success of this and other New England co-operative creameries. In short, first-class business management is needed—such as prudent men quickly learn from experience and

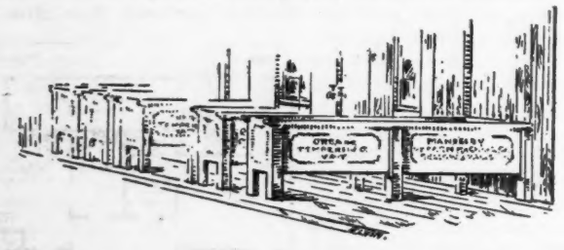


FIG. 6. CREAM ROOM.

observation. Making butter the year through—almost as much in December and January as in June—is another key to the success of our creameries. Indeed, it may be laid down as a rule, that the greatest profit in associated dairying is secured only when practically as much butter is made in winter as in summer, and if the surplus can come in January instead of in June so much the better.

*Estimate based on the business done from January to October. The statistics for the last three months are not completed; they may exceed the estimate.

†These payments are net to the patrons. No deductions or allowances are taken out of them. They show the net sum paid the patron for his cream taken at his door.

A statement by months of the chief items of Amherst's business will illustrate how well it carries out this cardinal principle,—and a hundred other New England creameries adopt the same policy:

MONTHLY REPORTS FOR TWO YEARS.

	AMOUNT BUTTER MADE. POUNDS. 1888	1887	RECEIVED PER LB. CENTS. 1888	1887	EXPENSE PER LB. CENTS. 1888	1887
January	21,986	19,714	30.82	29.88	4.28	4.29
February	20,434	18,250	30.66	28.90	4.26	4.32
March	21,869	23,395	30.42	28.90	4.65	5.14
April	22,661	23,543	28.57	27.91	4.24	4.79
May	24,505	25,639	27.38	24.88	6.77	3.55
June	25,933	25,506	24.08	23.29	4.45	3.82
July	23,275	22,298	24.92	23.98	3.94	4.19
August	20,072	20,395	27.15	27.40	4.74	4.85
September		18,171		27.92		4.94
October		18,902		29.59		5.01
November		19,280		28.49		3.64
December		20,872		30.52		4.57

The accompanying engravings give a very clear insight into the arrangement of the Amherst creamery. Fig. 1 is an exterior view showing the front side and north end of the factory building; the door into the ice chest of the refrigerator is shown at the extreme right; above is the front door to the tenement, next the door to the cream room, and beyond the door to the kitchen. Fig. 4 shows the plan of the first floor of the tenement, occupied by the butter-maker or superintendent. It is found best to have the butter-maker live in the same building so that he may be ready at all times to preserve the proper temperature and attend to any needed details, although the cost of the building is greatly reduced if the tenement is not included. At the Amherst creamery there are also two good rooms in the attic.

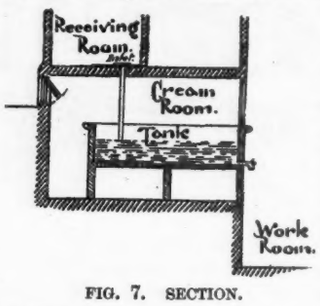


FIG. 7. SECTION.

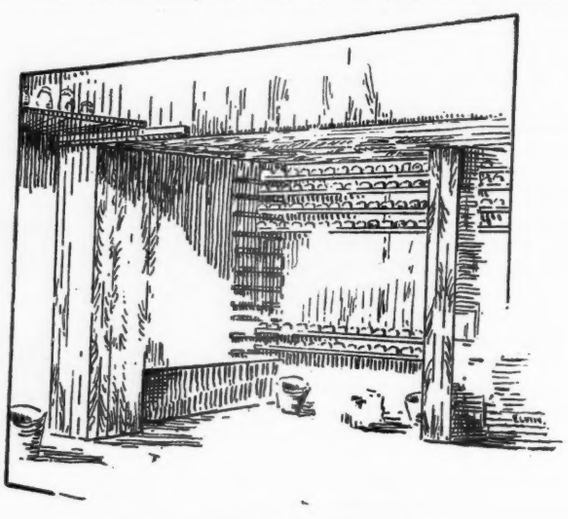


FIG. 8. INTERIOR OF REFRIGERATOR.

It will be noted that on the first floor, the cream-receiving room is the only one used in the butter business; all the rest is given up to the tenement. Fig. 2 illustrates the south end and west side of the creamery, the latter being provided with a wide piazza, so that wagons can be under cover while loading with butter. Fig. 3 shows the arrangement of the basement. The work room contains the churns and power butter worker, and a hand-worker where the butter is printed. There is a packing room opening into the cooler or refrigerator. The engine, boiler, etc., are in the smaller addition, separated from the work room by a brick partition. The cream room, containing the cream tempering vats, is raised above the floor of the work room. Fig. 5 shows the cream receiving room on the first floor, and Fig. 6 the cream room below, while the sectional view in Fig. 7 indicates the elevation of the receiving room, cream room and work room, and shows how the cream is poured into the vats from above. Fig. 8 shows an interior view of the refrigerator, a sectional

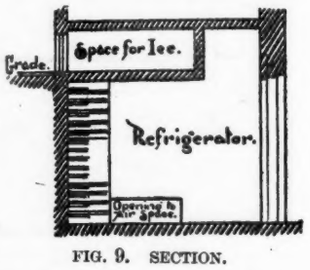


FIG. 9. SECTION.

view of which is also shown at Fig. 9. The ice is put in on the outside at grade, and the refrigerator is double-walled, so that the cold air from the ice chest circulates all about it. There is an opening at the bottom and another near the top on the other side to facilitate the circulation of the cool air, but this is not wholly satisfactory. Fig. 10 gives an excellent idea of the general arrangement of the

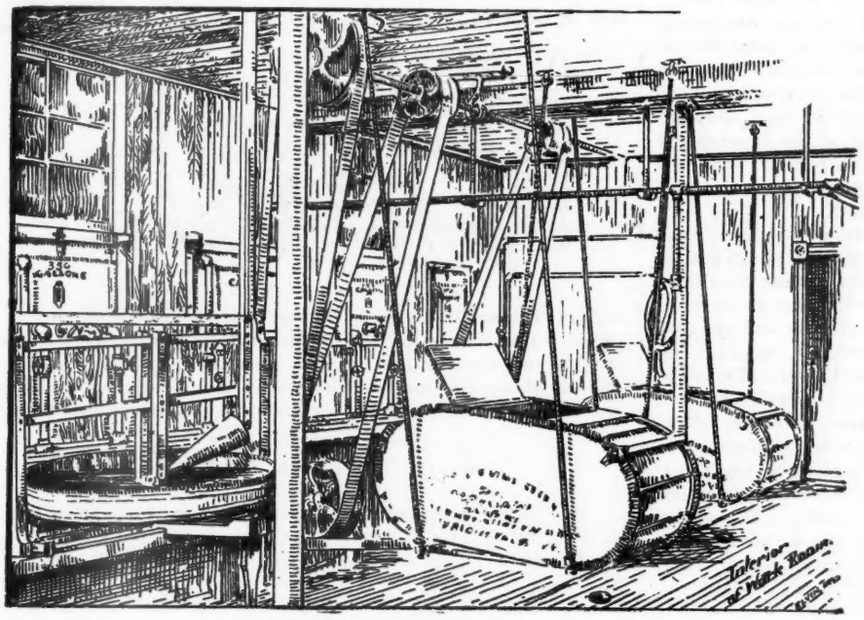


FIG. 10. INTERIOR OF WORK ROOM.

work room. This view is taken from the northwest corner of the room by the desk, near the door of the packing room. It will be noticed that the cream vats extend through the partition from the cream room into the work room so that their contents can be drawn off and the temperature regulated without leaving the work room. Fig. 11 is an enlarged view of the end of one of these cream vats.

THE FARM ICE-CROP.

While the farm lies buried in its wintry shroud, the ice crop is ready for the harvest. No farmer who has once enjoyed the advantages of having a supply of ice during the warm months will willingly forego them for a single season; for ice in midsummer is not only a convenience but a luxury. The earlier the crop is secured, the better. Although ice is sometimes formed late in winter, there are seasons when, if it is not secured early, the chance is lost for the year. In the Middle States it will do to cut ice when it is four to six inches thick, but in the more northern regions thicker ice can be obtained. The method of harvesting ice is shown in our engraving (Page 1). If the ice is covered with snow it must first be scraped off. Then lines are marked on its surface for the saw. An inch board, six feet long, with a cleat firmly attached across the lower end, is used to bring the blocks out of the water. Then they are shoved along the surface to the sleigh, into which they are loaded by means of an inclined plane of planks or boards. In packing in the ice-house surround the ice with some non-conducting substance and provide perfect drainage at the bottom and ventilation at the top. Sawdust is one of the best non-conductors, about one foot in thickness all around being sufficient. The interstices between the blocks should be filled with the same substance. No expensive structure is needed for an ice-house. Anything that will hold sawdust is sufficient for practical purposes. In the absence of other receptacles, one corner of a haymow or woodshed, partitioned off with rough boards, will keep the ice just as effectually as a more costly structure. When there is no other convenience, or the ice-house will not hold quite enough, the supply may be helped out by making a stack. Lay down a floor of rails, upon which stack the blocks as compactly as possible. Cover thickly with non-conducting material, such as straw, marsh hay or corn stalks. Finish the top so as to shed rain, and put boards and rails around the sides to keep the covering in position. In removing the ice, open always at the same place, and at the top. If the stack is large and well built, the ice will keep the greater part of the summer nearly as well as in a costly structure.

FARM STOCK ROTATION.

T. GREINER, NEW JERSEY.

That a judicious crop rotation is a requisite of good farming seems to be generally accepted, yet the majority of farmers are hardly aware that live stock might be included in the rotation system with profit. The following experiment or incident is certainly instructive, as it furnishes additional proof of the truth of this statement: Late in August I had four hens "come off" with about forty Langshan chicks. These, hatched from the same lot of eggs, were fed in the same way and managed under exactly similar conditions right through, except that three hens with thirty chicks were placed and kept on a comparatively new piece of land, while the fourth hen with the remainder of the chicks had to be satisfied with quarters in the old poultry yard. Those on new soil grew with wonderful rapidity, and have always remained perfectly healthy, while the chicks in the old yard, although taking a fine start, soon began to droop and to die off, until now there is not one left. Diarrhea took them all. As thorough, or (as I am tempted to call it) "wide" rotation, is one of the best and simple preventives of fungous diseases in cereals, vegetables and fruits, and often of injurious insects, so, if practiced with poultry, it must aid in preventing the attacks of cholera, dysentery, catarrh, and especially that dread of the poultry keeper, the gapes, as it is well known that moist ground is one of the links in the transfer-chain of the gape worm from one fowl or chick to another. The same principle, carried out in the management of hogs, is a reasonably sure protection from the attacks of swine plague or cholera, as I have had frequent opportunity to observe.

The system of stock rotation fits admirably to the system of general crop rotation, and in reality only increases its benefits and completes it. Take as an example the following rotation: Poultry, garden vegetables, clover, hogs, small fruits, rye or turnips with clover, poultry, etc. A crop of chicks (for broilers or otherwise) not only enriches the land, but aids in clearing it from weeds, especially if strips of it are turned over with the plow from time to time. Garden vegetables, such as melons and other vines, roots, onions, etc., generally thrive wonderfully after poultry, as everybody knows. Rich land and no weeds—what better could be desired for a garden? Grass and clover next put the land in suitable condition for a hog crop, etc. Sheep also may enter in such combinations. This or a similar system of thorough rotation should commend itself to every thinking farmer. It only needs the laying out of a number of fields, larger or smaller, according to the circumstances of each particular case; all must be properly fenced, and then used as suggested. The regular poultry yard with hen-house may be permanent if preferred; but the chicken-crop—the coops, the brooders, etc.,—should constitute one of the links in the chain of crop rotation, and will be found fully as important as any.

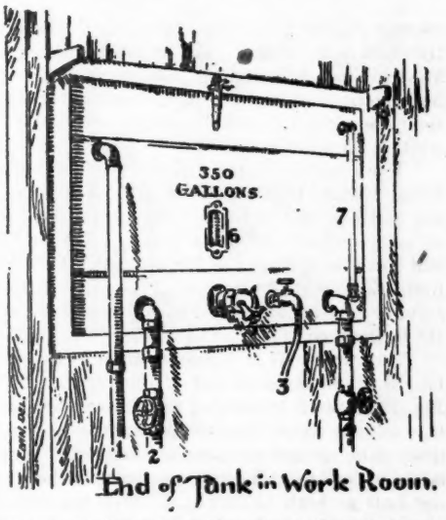


FIG. 11—1 indicates the overflow pipe; 2, the outlet for cold water; 3, the inlet for steam with which to raise the temperature of the water surrounding the vat; 4, the cold water inlet; 5, the faucet through which the cream is drawn off into pipes running to the churn; 6, a thermometer by which the temperature is judged; and 7, a gauge showing the amount of water in the space surrounding the cream.

TYPES OF BUCKWHEAT FLOWERS.

PROF. B. D. HALSTED, IOWA.

The blossoms of the common field buckwheat furnish an interesting illustration of two distinct forms of flowers in the same species or kind of plant. For example, one buckwheat plant will have all its blossoms of one type and another plant will bear flowers which differ materially from the first, but are very uniform among themselves. In other words, the flowers of any one plant are all alike in structure, but when all buckwheat plants are considered there are two distinct kinds. These two sorts are found in about equal numbers upon any large area of ground; in short, they are intimately associated in the field, but, because of the smallness of the blossoms, are not usually distinguished. There is, however, an important lesson of general application to be drawn from a consideration of the two types of the buckwheat flower.

Among the higher plants the flower is a structure specially designed for the production of seed. Flowers as they are generally understood are the showy parts of plants which appear for a brief period and are followed by the fruit, and this fruit bears one or more seeds. There are two essential organs to a perfect flower, one corresponding to the male and the other to the female in animals. The former are the stamens and the latter are termed pistils. The number of these essential organs varies in different species; but the buckwheat flower has one pistil, which occupies the center of the blossom, and surrounding it are the eight stamens, making a circle of slender bodies around the young undeveloped fruit—the pistil. The upper portion of each stamen consists of a plump body in which is produced a large quantity of fine dust, called pollen. This pollen when it comes in contact with the receptive part of the pistil, called the stigma, has the power of quickening the young seed and causing it to mature. This pollen or "flower-dust" is carried from the

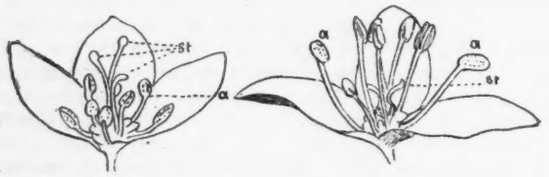


Fig. 1. Fig. 2.

BUCKWHEAT FLOWERS.

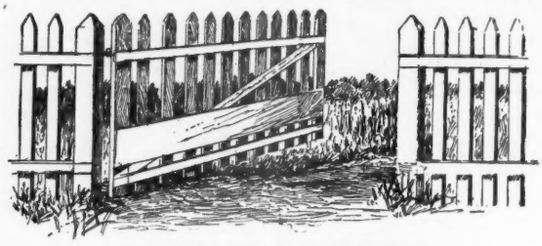
stamen, where it was produced, to the pistil, where it secures fertilization of the young seeds by insect agency. As the apiarist well knows, honey-bees are especially fond of the sweet secreted by the buckwheat blossoms and have secured for themselves an enviable reputation for industry, especially when the buckwheat fields are white with flowers.

Many careful experimenters have repeatedly determined that better results follow from fertilization when the young seeds of any pistil are quickened by pollen from stamens of some other than its own flower. In other words, cross-fertilization secures more and better seed than the fertilization which is confined within the limits of a single flower. If this be true in species having only one form or type of flowers the meaning of the two sorts of blossoms in the buckwheat is not far to seek.

The two kinds of blossoms differ in two essentials, namely, the length of the stamens and of the pistils. In the flower shown in Fig. 1 the pistil is divided into three parts at the top (*st*), and the tips extend some distance above the pollen pouches (*a*) situated quite close around the base of the pistil. In the other flower, Fig. 2, the opposite conditions are present; the pistil tips (*st*) are low—not half as high as in Fig. 1, while the stamens (*a*) are long. If measurements are taken it is determined that the stamens of one flower are on a level with tips of the pistils in the other, and the pistil tips are as high as the stamens in the other flower.

It has already been said that the buckwheat flowers are frequented by bees for the honey they secrete in abundance from eight yellow glands at the base of the stamens. These insects go rapidly from flower to flower and do not confine their attention to one sort. It may be that the bees make no distinction, and there is no apparent reason that they should, as both abound in nectar. It is easy to see that a large insect like the honey-bee, in visiting such flowers, would have one portion of its body dusted with pollen from the short stamens and another with that from the long stamens, and at the same time it brushes the pollen of each upon receptive tips of pistils of corresponding lengths. This difference in lengths of the essential organs is a decided check against close-fertilization, and even prevents in good measure the fertilization of any pistil with pollen from the same plant, because all the blossoms of any one plant are of the same type.

The buckwheat plant is one which is not satisfied with self-fertilization and it may be that the failure to form seed is due in many cases to the lack of proper attendance of insects. To many the buckwheat blossom may seem like a small matter, and a discussion of its types a case of needless hair-splitting. Let each remember that this seemingly slight difference of a quarter of an inch is a distance that cannot be disregarded, and Nature will persist with these types, whether men recognize them or not, until a better method of securing wide fertilization is secured through the slow process of adaptation and the survival of the most approved forms.



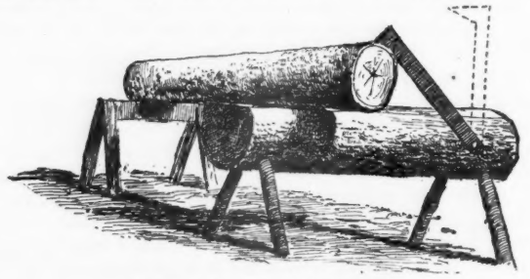
A SIMPLE FARM GATE PROTECTOR.

PROTECTION FOR A FARM GATE.

A constant source of annoyance on the farm is the destruction of gates by careless drivers. Let a new gate be put up and some one is sure to injure or completely break it down sooner or later. The device suggested by W. T. Whitsett, Guilford Co., N. C., and illustrated above, although simple, will save much vexation and repairing. The damage is generally done by the wagon hubs striking the frame of the gate, often getting caught behind the cross braces of the frame; and by a sudden jerk before the wagon can be stopped. On every gate, bolt or nail firmly a plank twelve or fourteen inches wide and not less than one inch thick, dressed on the outside, the entire length of the gate. The middle of the plank is arranged to be the same height as the hubs of an ordinary wagon-wheel. When the axle strikes this plank it meets no obstruction and is free to move on. Although simple and easily arranged by any farmer, this little contrivance will save many a good farm gate.

HOW TO HOLD A LOG.

The illustration below shows an effective device for holding a post or stick of timber while it is being hewn or sawed. A "horse" is made of any good pattern with either rough or sawed timber. To this is pivoted a "dog" or hook of iron or steel as shown in the engraving. The hook is driven into the log to be held in place, and is readily liberated by a few taps from below. Such a device can be made by any blacksmith, and may be light or heavy as desired.



DEVICE FOR HOLDING STICKS.

Breeding for Autumn Foals.—There are good reasons for the system adopted by some horse breeders, of having a part of their mares foal in the fall. The teams need not be so badly broken in the spring or the mares subjected to too severe exertion. The colts can be weaned on grass, and so suffer least from the change of food; and they are out of the way when the mares must go afield. This last point will be appreciated by all who have had colts injured by the mower or a runaway from the colt becoming entangled in the harness of the team attached to the plow. As the mare need not be hard worked during the winter, she can better suckle her foal.

and there is more time for handling the colt. Finally, with a warm stable the colt feels the weather less than a spring foal does the heat and flies of summer.

DUTCH BELTED CATTLE.

The cattle illustrated herewith are fairly typical specimens of a breed which has attracted much attention in some parts of the United States. The Dutch Belted Cattle were first brought to this country fifty years ago, yet it is only within the present decade that any organized effort has been made to obtain for them the recognition to which their merits entitle them. These cattle doubtless sprung originally from the same stock as the black and white cattle known in this country as Holstein-Friesian; but they now form a distinct breed, with the type so firmly fixed by centuries of careful breeding that their grades of even one-eighth blood retain the peculiar and conspicuous white belt which is the distinguishing characteristic of the breed. They are known to have been bred in Holland in the sixteenth century, and have always been regarded there as a rather fancy breed, mostly owned by the country gentlemen, who have always been reluctant to sell them. The belted cattle are remarkably uniform in shape and markings. In general they resemble the Holstein-Friesians, but are not as large. The heads, however, are of similar form, rather long, with fine muzzle and somewhat dashing face. The horns are fine and waxy, the necks moderately thin, the bodies wedge-shaped, with ribs well sprung and deep chests, udders very large, milk veins large and tortuous, legs clean, short and fine. In color they are black, with a white sheet or belt entirely around the middle, embracing one-third or more of the body. A comparison between the Belted and the Holstein-Friesian cattle is by no means disparaging to either breed. The latter have for centuries been kept on rich food and carefully bred with a sole view to developing milk or beef qualities, without regard to color marks. The former have been bred with equal care mainly to preserve their peculiar markings, and at the same time make a general purpose and family cow. While they have no such phenomenal milk records as the Holstein-Friesians, they are deep milkers, docile and kind in disposition, hardy and easily kept. When dry they fatten easily and their beef is of fine quality. These cattle were brought from Holland to Orange Co., N. Y., in 1838. Subsequent importations have been made until they and their grades are the prevalent style of cattle in that famed dairy region. They are also found in Montgomery county, in various parts of New Jersey, Eastern Pennsylvania and Illinois. An association of Dutch Belted Cattle breeders has been organized, of which H. B. Richards, of Easton, Pa., is Secretary. The animals illustrated herewith are from his herd. The first volume of the herd-book was published in 1886. It contains the records of forty-six bulls and one hundred and seventy-seven cows and heifers. The association is made up of enterprising and intelligent men, in whose hands this choice and unique breed will be kept up to the full standard of excellence.

GROUP OF DUTCH BELTED CATTLE.

Exercise the Mares.—Too many farm horses are kept idle during the winter. Through no fault of theirs, they consume all the profit from their labor during the summer. They would be all the better for at least paying for their keep during the cold weather—stronger, more vigorous, with better appetites and digestion, and inured to work when the plow is to be started. In the case of brood mares, there is the further reason for giving them exercise, that it is demanded for the good of their foals also. If the mare has moderate, regular labor, she will have a better appetite and digestion, hence greater vigor; and as is the vigor of the mare during pregnancy, so must be in a great measure the vigor of her foal. As the mare must consume and digest enough for the nourishment and growth of the foal as well as for her own needs, there is necessity of that exercise without which both appetite and digestion must weaken. Long confinement of any animal that has the ability to move freely is a severe strain on its nervous system, and most severe in the case of the horse, which is naturally the most active of our farm animals; and as the temperament of the young largely depends upon the nervous condition of the dam during pregnancy, and the value of the horse more than of any other farm animal is affected by its temperament, we see that depriving the mare of exercise may take much from the value of her foal. The foal can not be fully developed unless the mare has proper exercise; but the other extreme of violent or sudden exercise must also be avoided.

POSSIBILITIES OF NEW MEXICO.

RALPH S. TARR, TEXAS.

Southern New Mexico, though practically a desert waste, is even now a region of much economic value, which presents great possibilities. It may practically be divided into three tracts, each having its particular industry—the mountain or mining tract, the plateau or cattle country, and the valley or farming region. The mountains contain ore of untold value. On account of the remarkable evenness of climatic conditions, cattle raising is of great importance, being hampered only by the scarcity of good watering places. The Rio Grande, supplied by melting snows and rains from the Colorado mountains, furnishes a constant stream of water which, wherever the alluvial valleys are broad, is turned aside and spread over the soil to raise the crops which otherwise would not grow. A few other streams, much smaller, serve the same purpose; but other than these limited tracts of irrigable land there is no farming land in all the vast New Mexican territory, except some mountain valleys where limited crops can be raised.

The whole great territory is a vast desert with here and there an oasis on the river banks, and on every side mountains rising out of the far reaching plateau. For nine months in the year no rain moistens the parched soil, and during the three remaining months there are only occasional heavy showers. There are no prolonged storms; the sky is seldom clouded, but day after day the bright sun pours down from the clear blue heavens, taking every drop of moisture that is held in the soil. The cause of this extreme aridity lies in the fact that we have here a basin shut in on every side by high mountain peaks which prevent all moisture-bearing winds from either ocean from passing their boundaries. The plateau is elevated five thousand feet above sea level, and the mountain chains rise five thousand feet or more above this. On account of the great height, in spite of the southern latitude and of the absence of clouds, the country about the mountain base has a most perfect climate. Day after day the sun shines clear and bright, neither too hot in summer nor too cold in winter. Blankets are necessary for comfort at night the year around. Snow falls only at long intervals, when an inch or so may cover the ground at the base of the mountain, the outline of a heavier fall in the region above.

If water were present it would be a garden spot, and how to supply the deficiency is the problem under consideration. During the summer the rains in the mountains are numerous and often of such violence that mountain torrents rush down the canyons carrying everything before them and extending out on the plateau for many miles before being soaked up by the spongy soil. These canyon arroyas, which in times of heavy cloud-bursts are filled with rushing, tumbling currents, soon become dry. In the spring, when the accumulated winter snow begins to melt, these streams become active again and their activity lasts a month or more; then they are dry again. To dam back this water and keep it from hurrying away and wasting itself on the desert land is the problem the survey recently provided for by Congress has to deal with. When this is accomplished farms will take the place of cattle ranches, and gardens the place of the desert. The expenditure of money will be large, but the returns will undoubtedly more than repay the outlay. The government owns the lands, and they are of little value; hence, it is the duty of the government to improve them, if possible, so that they may be of use to the people. Farming by irrigation has proved a success in every country where it has been tried. The preliminary expense of building the reservoirs is so great that private companies have not entered into the undertaking; but if the government experiments are a success, no doubt private enterprises will add to the area of reclaimed land.

When the system has been well established, and orchards and farms dot the desert, other beneficial results may be expected. The water, instead of falling and rapidly disappearing, will be little by little spread over the land and allowed to evaporate gradually. The vegetation, too, which has been artificially grown upon the region, will tend to prevent rapid evaporation. Under the present condition much of the rain which falls in such torrents runs immediately into the rivers and thence to the sea, thus getting outside of the desert region. If now there is a covering of trees and a coating of sod in place of the barren sand, more of the rain will be held in the region. We are on the road to great possibilities.

Bees in Winter.—Any disturbance during winter is damaging to bees. When alarmed from any cause they gorge themselves with honey. Being confined to their hives on account of cold weather they cannot take a flight to throw off the excrement, and thus they contract a fatal dysentery. To prevent any of this in winter, the careful apiarist puts everything in good condition before winter begins. On account of the sudden changes of the temperature at this season, bees should be left in the cellar until all danger of cold weather is over. They will breed more rapidly in chaff hives in early spring, and these are therefore more desirable than hives in which the bees are exposed to such sudden changes. It is true that chaff hives, as generally constructed, are not well adapted to secure the best results in surplus honey, but they may be improved so that this objection will disappear. A chaff hive, properly constructed, is very convenient for surplus honey storage, but not when built with an immovable solid upper story. A. H. DUFF, Ohio.

THE BEST TREES FOR SHELTER BELTS.

W. D. BOYNTON, WISCONSIN.

White pine, Norway spruce and Scotch pine are the best species of evergreens for shelter belts. The white pine, though somewhat more difficult to establish than the others mentioned, is an excellent tree for this purpose. It has a scant root when young, and should therefore be carefully shaded, mulched and watered at the start.

The Norway spruce is, perhaps, all things considered, the best for shelter belts. It has a good root, is of rapid growth, has a fine full foliage, and beautiful form. It should have a naturally good soil. Manure should never be used for this or any other evergreen. The seedlings or young transplanted trees usually sell at a higher price than the pine, for the reason that not being natives of this country they must be nursery grown; but when they can be had for from $4 to $6 per hundred, when eight to fifteen inches high, this fact ought not to prevent their being planted where a good shelter belt is wanted. The branches of the Norway spruce will thickly interlace so as to present an almost impenetrable barrier to the fierce winds and driving snows. Some of these belts have been found to reach a height of seventy-five feet. Such a shelter belt is worth hundreds of dollars to any western farmer. It is poor economy to withhold the investment of the few dollars needed to secure such an invaluable protector about his buildings and grounds. The demand for Norway spruce for shelter belts is steadily increasing. This tree is also used to quite an extent in hedges. It stands trimming and training well, and can be grown to any desired height.

The Scotch pine is now being largely planted on the plains, especially for shelter belts. While it is a rather coarse tree it possesses considerable merit for this purpose. It is of rapid growth, exceeding even the white pine the first ten years of its life. Like the white pine it will thrive on poor dry soils, and for that reason is often superior to the spruce for shelter belts in some locations. In the long run, however, the white pine excels it, both in rapidity of growth and value of timber.

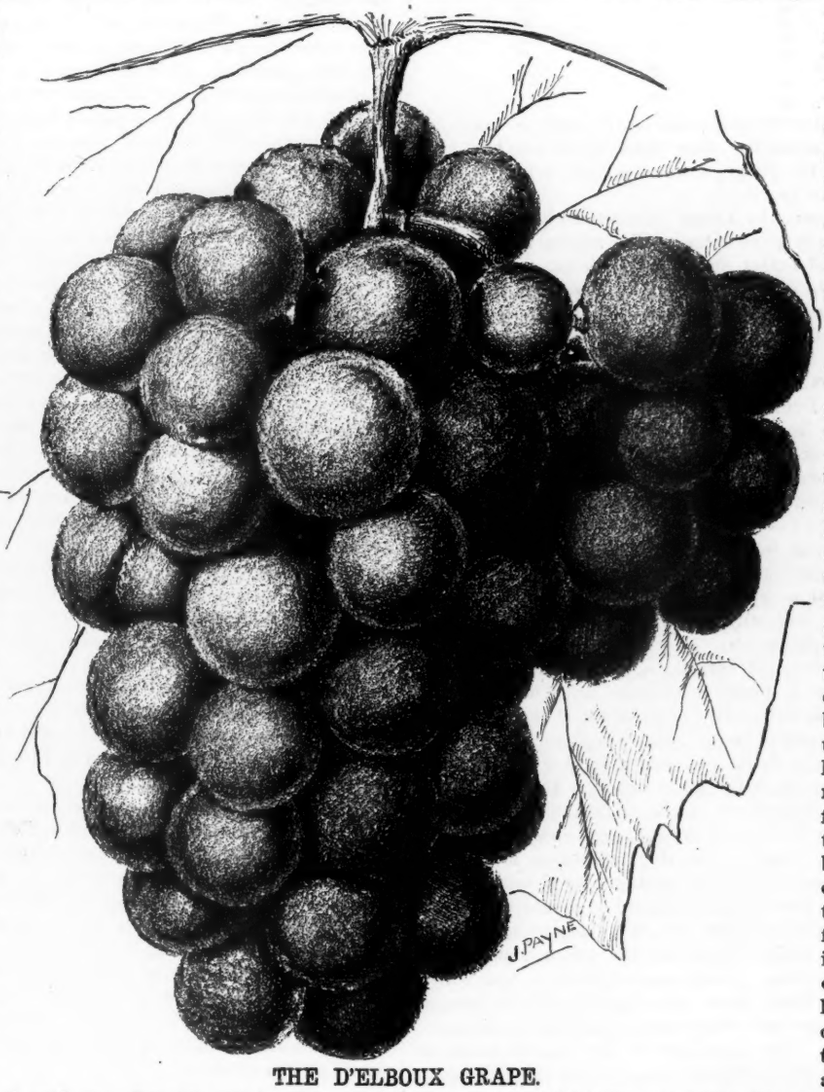
This list of evergreens for shelter belt planting is not extensive. There are many varieties not named here that may do fairly well for this purpose in some sections of the country, but for the naturally timberless regions of the West, where protection is imperatively demanded, the well-known and tested kinds only should be planted, unless indeed in a small way for the purpose of experimenting. In some of the most exposed, and naturally treeless portions of the West and North-west, I would advise early settlers to start shelter belts at once from hardy native deciduous trees. These can often be had when the better classes of trees would not, at first, get a hold. Nor should people wait a year longer than is absolutely necessary to secure some kind of shelter. The hardy native trees will much sooner attain a sufficient size than will the more valuable slower growing evergreens. Of these we may make mention of the cottonwood, box elder, soft maple, ash and white elm. A few rows of these will accomplish wonders, even in the face of a tornado. If placed not far from the buildings, they receive the head of wind in its mad course, bend before it, but deflect it in an upward and onward direction, and thus carry it over the buildings, saving them in many cases from total wreck. Even a row of willows will do this. They may bend half way to the ground under the tremendous shock of the wind, but they offer an obstruction something like the side of a hill from which the wind current bounds upward, and is obliged to leave a little portion of its track undevastated. Many a farm-house has been saved from destruction in this way.

A daily growth in swine of a little more than a pound is more profitable than less or more. This daily growth increases with age until the maturing period is nearly reached.

SOIL MADE WARMER BY DRAINAGE.

JOHN M. STAHL, ILLINOIS.

The amount of heat in the soil is a matter of the highest importance to the farmer. The reader need not be told that it has a great influence upon the germination of seeds and the growth of plants. A certain amount of heat in the soil is essential to germination and growth. A certain amount of heat is also essential to the decomposition of carbonic acid by plants. Indian corn will not decompose carbonic acid at a temperature lower than about fifty-nine degrees. If the temperature of the soil can be raised, plants will grow faster. Our farm crops may wither in midsummer; but this is not because the soil is too warm, but because there is a lack of moisture in it, or, what is oftener the cause, the atmosphere is so dry that the moisture is exhaled too rapidly from the plant. It would be very advantageous to increase the warmth of the soil in the spring, for by so doing we could get plants started several days earlier, and their growth would be more rapid. In the North, especially, the seasons are too short for many plants; and even those which mature well enough would make a heavier yield if started earlier and forced along for the first few weeks by a warmer soil. There are several practicable means for increasing the warmth of the soil. Draining is one of them, and this is the best season for determining the amount and probable cost of such work to be done during the year. In general, there is not so much need of soil drainage in this country as in Great Britain and on the continent; yet very many, if not a considerable majority, of our fields would be benefited by drainage, the benefit being greater than the outlay. Drained soils are warmer than undrained ones, because much of the water which passes through them would otherwise be evaporated; and this evaporation, it must be remembered, requires enough heat to make the water into vapor. The amount of heat thus used is quite large. It is likely equal to that produced by burning two-thirds of a ton of coal per day for each acre on an average throughout the year. If this heat were not absorbed by the water, it would be largely absorbed by the soil, if all of it were not. The specific heat of water is greater than that of the soil—five times as great as humus, seven times as great as loam, eight times as great as clay, and ten times as great as sand. Hence, more heat is required to warm up a certain weight of water than to raise the same weight of soil to the same temperature. As drains remove an excess of water in the soil, in the spring at least, it would remove water that otherwise would take heat from the earth. More than this, water is a very poor conductor of heat, and when the soil is wet, as in the spring, the heat will penetrate much more slowly than if the water were removed. In Prussia it has been officially determined that on an average the snow there melts a week earlier on drained than on undrained land; and the difference would not be less in this country. A difference of ten to fifteen degrees in the temperature of drained and undrained soils has frequently been noticed; and the constantly higher temperature of drained soils is doubtless responsible for much of the larger growths upon them, and often would, alone, pay for draining.



THE D'ELBOUX GRAPE.

THE D'ELBOUX GRAPE.

The accompanying illustration, drawn from Nature, represents a new hybrid grape which has attracted marked attention wherever it has been exhibited, and has been awarded a large number of special and regular prizes. It is a seedling of Telegraph, fertilized with Black Hamburg, and was raised by Mr. C. J. Copley, of Staten Island, N. Y. Bunch and berries are of large size, single berries not rarely measuring one inch in diameter; berry globular, flattened, color black; skin thick; quality very good, with rich muscat flavor. The leaves are very large, slightly three-lobed, dull green on both sides. The vine is a rampant grower, very strong, dark brown, with short jointed canes. We are not aware that this new variety has been grown outside of its place of origin, but from what we have seen of it we consider it highly promising for cultivation in the Middle and Southern States.

How to Kill Beeves.—An animal is best killed with a rifle ball, shot midway of a line drawn from one eye to the opposite horn; but it may be killed by a blow on the same spot with a sledge hammer or the head of an ax, first blindfolding the animal. As soon as it falls, cut a gash square across the throat back of the jaws, deep enough to reach to the spinal column. The animal may be run up at once, or not until skinned, or it may lie until the entrails are removed, as may be preferred. Cut the hide from the throat along the brisket and central line of the belly, between the thighs to the tail; and from this cut along the inside of the legs. Take off the fore legs at the knee joints and the hind ones three inches below the hock joints. If the animal is on the ground, remove the hide from the upper side of the carcass to the back bone; then turn the animal over and skin the other side. If the animal is hung up, begin above and work down. Be careful not to cut any gashes in the hide. Use the thumbs wherever it is practicable to do so. To remove the entrails is not difficult. Open along the middle of the belly and brisket, cutting from in outward, running the fingers along ahead of the knife through the belly. The animal should have had nothing to eat for twelve hours before it is killed. Its entrails will not then be distended and the carcass will cool better. As soon as the entrails are out, wash the inside thoroughly with cold water, using a cloth where necessary to take off blood. Stretch the slit in the belly open by setting in short sticks to keep the carcass open and facilitate cooling. As soon as the carcass has cooled, divide it in halves by splitting the back bone, working from the inside. First cut through the flesh and then saw through the bone. Do not cut bones—saw them.

LESSONS FROM THE DAIRY EXHIBITIONS.

JAMES CHEESMAN.

The exhibits of dairy products at the recent fall fairs manifest a decided improvement over those of one year ago. At least, this is true so far as New York, Canada, and the New England fairs are concerned. The average of quality shows a decided improvement in the butter and cheese display. The task of improvement is still incomplete. There is always some unfilled position in dairy manufactures, and that is the one always open for competition. The point of highest excellence is not yet won by the best of dairymen, and if this be true of the best, what shall we say of the average? Let the average man, or the exhibitor pick up a score card, and ask himself the meaning of the separate items in any of the following scales for butter:

	CANADIAN.	CHICAGO.	VERMONT.
Flavor	40	40	50
Grain and body	30	25	25
Color	15	15	15
Salting	10	10	10
Package and finish	5	10	
	100	100	100

In each of these scales, three-fourths of the score is based on flavor, grain and body, leaving the other characteristics to be divided as may seem fair to the judge, whose decision is largely governed by the caprice of the markets.

The conclusions suggested by a large number of high class farm butters and creamery-made goods demand the careful attention of every feeder of stock and butter maker in the land. Farmers do not realize that the whole difference between a choice farm butter and creamery goods is one of breed and feed. The difference between a French butter and the Danish or Swedish goods is very wide, but it is in flavor, body and grain which aggregate seventy-five points out of one hundred. Again, the difference between the products of Sweden and Denmark and those made in the best farm dairies of England is no less pronounced. The best products the world over are made to order; that is, the producers manufacture them to meet a specific demand for goods having well defined characteristics which are as uniform as a piece of fine woolen or silk.

How can the creamery man improve his goods without increasing their cost? The average butter maker does not sufficiently appreciate the value of a good thermometer. He is not observant enough of weather conditions, and does not realize that five degrees lower temperature to-day will call for more careful manipulation of the temperature in the ripening vat. The ordinary thermometer is barely accurate enough for good, reliable work and, such as it is, it is not as carefully used as it might and should be. Differences in the ripening of cream affect the flavor; the action of the lactic ferment is on the volatile fatty acids of butter, producing a change which can never be wrought by the oleo manufacturer mixing milk with his crude fats. The degree of lactic acid produced, and the time taken to produce it, constitute success or failure in cream ripening. The rule can only be learned by intelligent observation.

Having obtained his cream in the right condition, it is quite possible to spoil the product by over-churning. Good butter makers do not yet agree as to how long the churning should be carried before stopping. All will admit that it should cease when the butter reaches the granular state. What size the granules should be is a question still undecided. Churn manufacturers, and many butter makers taught by them, favor the wheat grain size; others prefer the size of very large shot, while many choose the form nearest to good sized clover. The argument of the manufacturer of dairy apparatus is based on increased quantity, but he has never yet proved that the increase of churn product is pure butter fat. The whole object of granulating butter is to enable the maker to remove more thoroughly by washing the last dregs of buttermilk, and to more completely remove water on the butter worker. When buttermilk is not removed there remains behind a residue of curd or caseine which varies from one-half to two and a half per cent. In really choice butters this matter rarely exceeds one and a quarter per cent, or ten ounces in a fifty-pound tub. If by care the maker can reduce this to one-half per cent, as he very easily can in most cases, then a tub of fifty pounds will not contain more than four ounces. This ingredient in butter, when exposed to changing temperatures, produces most of the mischief which affects its market value and injures its permanent or uniform character. Caseine is a nitrogenous body, softened and partially dissolved by lactic acid, existing in so finely divided a physical condition throughout the body of the butter that it is invested with tremendous power for evil under favorable conditions of temperature. This ingredient is the cause of rancidity, and effects most of the transformations in flavor to which butter is subject. Control over this factor implies good pure water, as well as skilled observation from the maker.

PRELIMINARY GARDEN WORK.

JAMES K. REEVE, OHIO.

One of the most difficult matters for a beginner in gardening to determine is the stock of hot-bed plants which he should prepare, the size of the beds, and the amount of seed likely to be required. The plants needed by a gardener supplying a village or town trade will ordinarily be confined to cabbage, tomato, sweet potato, celery, and perhaps a limited amount of pepper and cauliflower. If he intends to grow the plants (as well as the product of the plants) for sale, care must be taken to arrange the supply so that the demand may be met without interfering with the stock for home-planting. While the sale of plants is quite profitable, it is poor policy to sell them to the impoverishment of your own needs for early planting. First determine as definitely as possible what your own requirements will be and prepare and keep intact the beds for this purpose, having a separate set from which to sell.

In sections where sweet potatoes are grown these plants will probably be needed in greater numbers than any others. One barrel of sweet potatoes will seed a bed about six by fifteen feet, and may be relied upon for 5,000 to 6,000 plants for the first setting and for a second crop of at least as many more; and a third crop of plants may frequently be had before it becomes too late for setting them out, although this cannot be definitely depended on. The rows being three feet apart and the plants fifteen inches apart in the row, an acre will require 11,760 plants, and it may be readily determined how many will be needed for home use. Usually there need not be any fear of planting too many. There are few sections in the Northern States where there has ever been any serious overproduction of this crop, or a sufficiently large production to run the price below the point of profit. In the North it has not become a general farm crop. Farmers seem to be constitutionally opposed to growing hot-bed plants of any kind, and when buying only aim to secure enough for the needs of their own home consumption. In deciding upon the number to be planted it must be borne in mind that thorough cultivation implies considerable hand labor, as two hoeings, at least, should be given to exterminate the weeds from the centers of the hills and to keep the vines loose upon the ridges and so prevent the suckers from rooting. While there is no large sum to be made from the sale of plants within a restricted locality, it is fairly profitable work as far as it goes. A barrel of seed sweet potatoes will usually cost from $3.50 to $5.00, and plants are sold at various prices, according to season and locality. Northern growers should always procure Southern or New Jersey seed, to insure quality and flavor of the product.

Next in importance comes the cabbage. Only the earlier supplies of these need be grown under glass; the late plants may be placed in rich beds in the open ground. The amount of early plants set out should be strictly limited by the demand of the home market, unless the grower is within close shipping distance from a large city. It is a crop that will not pay to ship a great distance (except the earliest supply from the South to Northern markets) and it must be disposed of as soon as grown, as it will not keep long after it heads. It is well to provide for two or three successive plantings of early cabbage, to be followed by the same quantity for summer use. A couple of thousand plants for each setting would be a fair quantity for a gardener selling in a town of 5,000 population. Two ounces of seed sown thinly in drills eight inches apart, and requiring a bed six by twelve feet, would about supply a single planting as above proposed. If five such beds were sown at intervals of a week each it would give the proper succession of plants for the spring and summer stock.

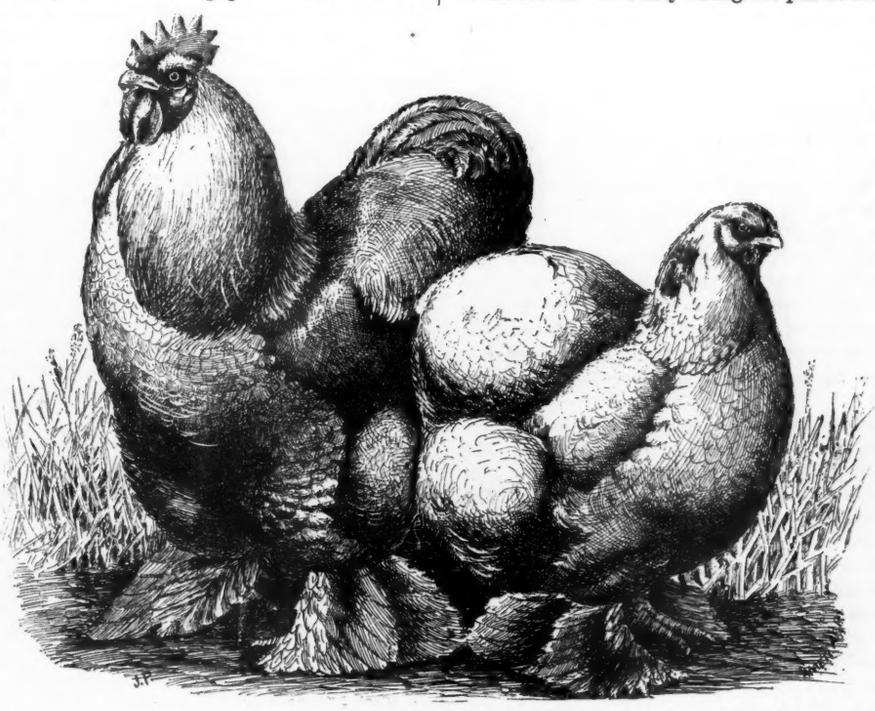
A Sunflower Hedge.—A willow hedge across the garden or on the north side of it, is a great protection, but while waiting for this to grow plant three or four rows of sunflowers across the piece. When the flower stems begin to grow drive some lath in the row about six feet apart, bracing the outside ones well; then stretch two or three lengths of binder-twine on each side of the row, winding them once around each lath, and wind some cotton twine around the middle pair of strands between each cluster of flower stalks to keep them from falling or being blown down. The seed heads must be gathered as fast as they ripen and open enough to show the seed, and spread out in a cool dry place to dry out thoroughly, when the seed

can be rubbed or threshed out with a light stick, and cleaned in a fanning mill or winnowed out by the wind. In the fall plow up a few furrows on the south side of the stalks which are left standing through the winter; harrow and work down fine and plant onion sets at once. The hedge or sunflowers will catch and hold the snow, and so protect the onions during the winter that when the snow is off the ground in the spring they will start at once into growth, and furnish the first early green onions.

R. G. NEWTON, Faulk Co., Dak.

COCHIN FOWLS.

The first Asiatic fowls carried from China to England, nearly half a century ago, were Cochins. Their advent created wild excitement among fanciers, and astounding prices were realized for the new breed, as high as one hundred guineas ($525) being paid in several instances for a single cock. They were brought to this country, and then came the memorable poultry mania or "hen fever," which found a fitting historian in the droll and witty Burnham. But the Cochins of those days were quite different looking fowls from the specimens shown in our illustration. They were tall, leggy and awkward. In course of time the Cochins were bred up to a high standard of excellence, and in the face of competition from other new breeds they retained a share of public favor. Twenty years ago a trio of Cochins of approved strain often sold as high as thirty dollars. But the Plymouth Rocks, spangled and white, the Wyandottes, with their varieties of white and golden, and other recent favorites, have caught the popular eye, and the older breeds no longer command fancy prices.



PAIR OF BUFF COCHIN FOWLS.

Cochin fowls, although they never did possess the superlative qualities attributed to them, have many substantial merits. They are plump and compact in shape, as shown by the accompanying engraving, with neat, small heads, short necks, broad, full breasts, short legs, with thighs abundantly furnished with fluff, and shanks feathered to the toes. Neither sex is very largely endowed in the way of tail, the limited appendage of the hen being nearly covered by the saddle feathers, while the short sickles of the cock are quite inconspicuous. They are very hardy, their thick, fluffy coat protecting them from almost any ordinary degree of cold; are quiet and tame, mature early, and are fair winter layers. They have little value as table fowls, the carcass being bony and the flesh of very inferior flavor. The hens are inveterate sitters, but not good mothers, as they are liable to crush the chicks under their clumsy feet. They are best fitted for the use of village residents and others who desire to keep fowls in limited quarters.

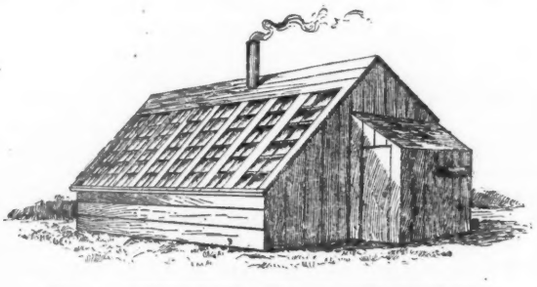


FIG. 1. PERSPECTIVE VIEW OF POULTRY HOUSE.

WARMING THE POULTRY HOUSE.

P. H. JACOBS, NEW JERSEY.

There are many ways of warming a poultry house, but the plan shown in our illustration is not only a cheap one, but it also ventilates the poultry house by supplying fresh warm air. Fig. 1 shows a poultry house with a lean-to under which a small stove is kept. Any kind of flat top stove, or even a kerosene oil stove will give sufficient heat. Forty degrees Fahrenheit is warm enough for a poultry house; hence the size of the stove depends on the length of the house. It is easy enough to put a stove in the poultry house, but we wish also to ventilate the house while warming it, as well as to make use of a kerosene lamp, or small stove, if but little warmth is required. Fig. 2 is simply a closed box, one yard square, and one inch deep, made of ordinary sheet iron. The box, or heater is placed on a small stove, or if legs are attached to each corner of the heater, a lamp may be placed under it. The cold air comes in at A, passes through the box, becoming heated, and emerges at the pipe B. The cold air pipe is half an inch in diameter and the warm air pipe one inch. The pipe A should be long enough to extend through the walls to the outside, so as to bring in the pure air. These pipes may be made of tin. By bringing in the fresh air and heating it, the poultry house is not only ventilated but warmed. This permits of closing it tightly, so as to avoid the cold air. No ventilators on the top of the building will be required, and the air will keep the house dry. Always bring the air in and discharge it near the roof, as the birds will not then crowd, or become lame, as they will when the warmth is below them.

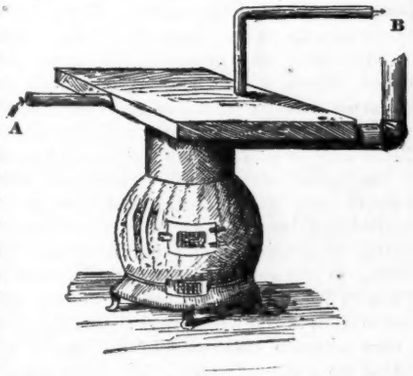


FIG. 2. HEATER FOR POULTRY HOUSE.

Work the Bulls.—Yes, work them. They learn in a few days to work single or double, in horse-power, cart, wagon, plow, harrow, on farm or highway. They become as harmless and docile as the gentlest oxen, are much less dangerous than horses, and in some things do more satisfactory work. I worked them many years. Working makes them better sires and their progeny more hardy and thrifty. They should be well fed and cared for; and the vast amount and variety of work done by them will many times overpay the expense of their keeping. If worked properly they acquire no bad habits. When worked double, they never fight or annoy each other when out of harness, in pasture, or at the manger; but I have seen them combine and simultaneously attack strange bulls coming on the grounds they frequent. In log

ging they are superior to horses and often worth many human laborers. We should have less complaint of sterile bulls if all were trained to work. DR. D. L. PHARES, Mississippi.

WHEAT FARMING IN THE NORTHWEST.

During the last sixty years New York, Ohio, Indiana, Michigan, Illinois and Iowa have each successively been claimed as the great wheat producing region, "the granary of the continent;" but in each State the production has fallen off after the first few years, and none of them has for several years produced enough wheat for its own consumption. During all these years except the last decade, the real wheat region of the continent lay untouched save by the feet of wild beasts and equally untamed savages. If a line is drawn directly north and another directly west of St. Paul, Minn., these would define the eastern and southern boundaries of a region better adapted to the production of spring wheat than any other part of the North American continent. This vast region has been broken only in a comparatively limited portion of its south-eastern corner, and at remote intervals to the Peace River valley in British America. The greatest development has been made in that section of Dakota lying along the Red River of the North. There wheat farming is conducted on a scale commensurate with the magnitude of the region of which it forms a portion. The largest farm there is the Grandin, containing forty thousand acres, but many others range from that down to three thousand acres. On these great farms the system pursued has for its object the production of the largest amount of wheat with the smallest amount of manual labor. With the improved implements now in use, one man and four horses on an average are employed for each one hundred and sixty acres.

The series of engravings on Page 15 gives some idea of "bonanza" wheat farming, from the furrow to the warehouse. The plowing (No. 1) is done by double gang-plows, each drawn by four horses, and throwing two furrows each fourteen inches wide. The raw prairie sod is first "broken" to the depth of two inches. After it has lain long enough for the sod to decay, it is "back set" by running the plows lengthwise of the original furrows, five to six inches deep. On any of the large farms it is quite usual to see four teams following one another down a furrow a mile long. A single bout of a mile and back with the four teams plows something over two acres. The next operation is to harrow the soil, which is done by a gang of four harrows drawn by four horses and covering a width of twenty-four feet. The seeding which follows has hitherto been accomplished by means of broadcast seeders, sixteen feet wide. But more recently the press-drill, shown in No. 2, has been found greatly superior. It saves one-third of the seed, one bushel per acre being ample, whereas a bushel and a half are required for broadcast seeding. With the later machine each drill-foot is followed by a wheel which presses the soil firmly over the seed—a great advantage where the light, friable soil, if left lying loosely, is liable to be blown away by drying winds. The drills employed on the great wheat farms are drawn by four horses each, and seed a space sixteen feet wide.

After the velvety green of the young wheat fields has grown to billowy seas of verdure, which in turn are changed to golden hue, they are ready for the harvest. Then the self-binders (No. 3) are turned into the fields. Sixty-five of these harvesters are kept on the Grandin farm, and proportionate numbers on other farms. The header, which is so generally employed in the drier climate of California, has not proved as successful in the Northwest, and the wheat is left in shocks until sufficiently dry for threshing (No. 4). This is done by machines of the most improved construction, driven by the power of traction engines, and attended by quite a little army of men and teams. The threshed and cleaned grain is handled to a large extent in bulk, without bags. Bulk-wagons (5) holding forty bushels, and drawn by four horses, are employed in hauling to the warehouse or railroad elevator. The latter structures, of which Fig. 6 shows a typical specimen, are found at every railroad station in the wheat region, and the number at each station is a very accurate indication of the extent to which the country is settled up and cultivated. The large farms are mostly provided with "flat houses" of their own, and there is an increasing movement among the smaller farmers to build co-operative warehouses for storing wheat. There are manifest advantages in providing storage where the grain can be held by the producer instead of being obliged to rush it on the market as soon as it is threshed.

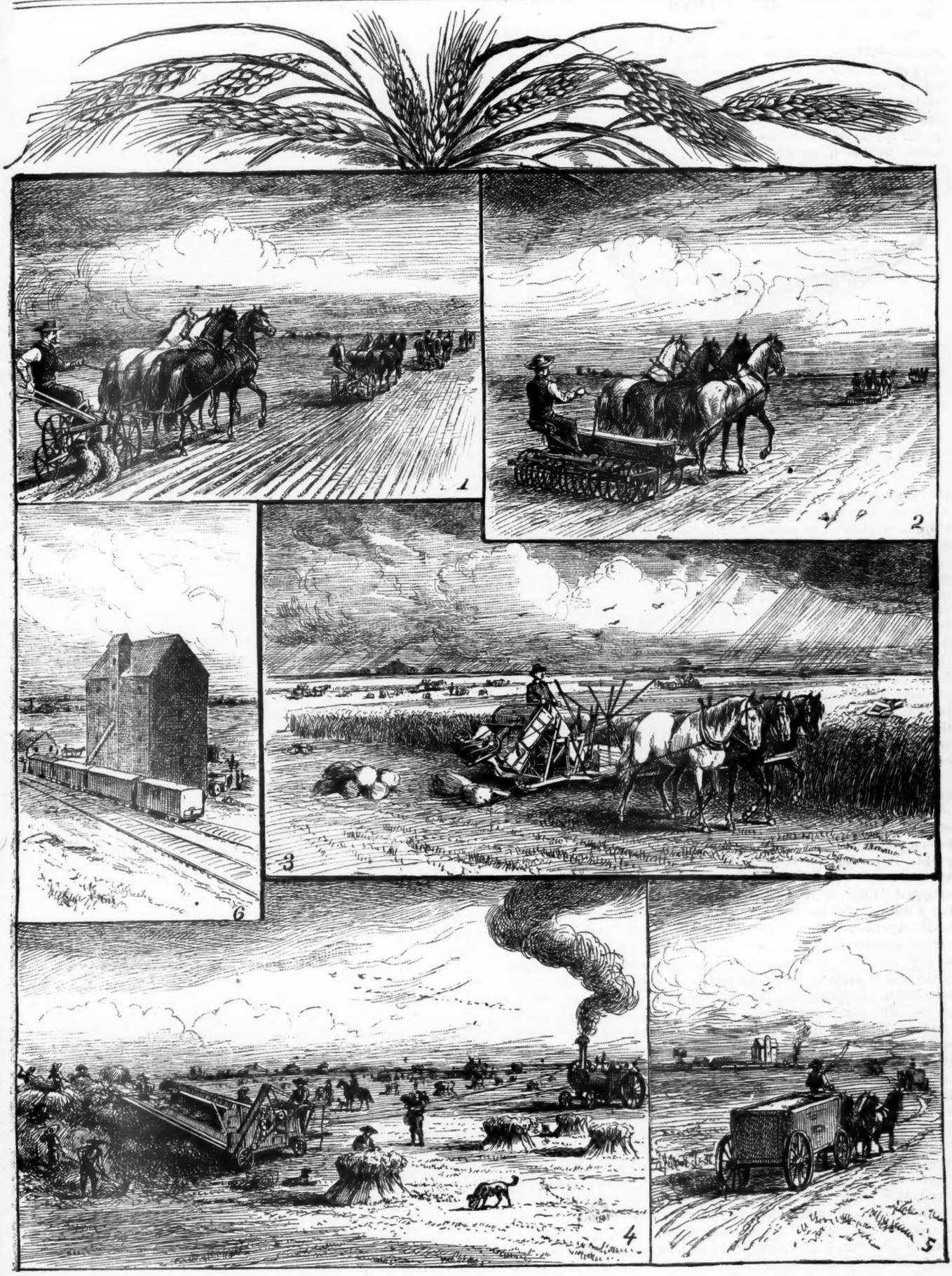
The season of 1888 was not a wholly satisfactory one for wheat growers. In the Northwest deluging rains in June were succeeded by many weeks of excessive heat. Then, early in August, while the grain was still immature, came a week of low temperature with two nights of frost which was most destructive where the wheat was most rank and succulent. This destruction extended over so large an area as to reduce the average yield of wheat in Dakota to nine and one-fifth bushels per acre, according to the estimate of the United States Department of Agriculture. High prices for wheat have rendered the year's crop, on the whole, fairly profitable. These August frosts were exceptional and may not recur in years.

BEST FEED FOR DAIRY COWS.

Farmers have a much greater sphere of influence on the flavor of milk produced than many suppose, or they are willing to admit. The reason why a certain number of consumers in all large cities are willing to pay what, to a farmer or an average consumer, may seem extraordinary prices is because they get butters of high flavor which are always uniform. The makers of these butters nearly all use clover and meadow hay and corn meal, in varying proportions with other coarse fodder and meals. The makers who produce the finest flavors prefer clover and meadow hay, cut on the green side just before maturity, and carefully cured, fed with corn meal, ensilage and roots. Forage plants harvested just before maturity contain their maximum of nutritive matter, and therefore their highest flavors. When the coloring matter of plants is allowed to bleach out, as in hay or corn stalks, the flavor, or the best part of it goes with it. This fact is one of the best reasons for the practice of feeding ensilage, for by no other method of treating fodder corn can the color be so well preserved. The Swedes and Danes use small quantities of rape cake combined with their grains and fodders to produce the uniform flavors which their butters possess. The Englishman uses a wider range of mixtures, including fine clover and meadow hay, small quantities of carrots, or mangels, middlings, shorts, bran, pea and oat meal, corn and cotton and linseed meals in various proportions. In the United States, the farmer has everything at his command for feed which he can desire, with corn ensilage of the best quality. Successful feeders compound their rations from many sources rather than few, as much for the purpose of maintaining health and vigor of digestion as for the food of varied flavors. At present prices, there are no cheaper bases for dairy rations than gluten and cotton seed meals, mixed with enough bran and shorts or whatever else is cheapest on the market. With hay at present prices and plenty of corn stalks, most men will be able to construct cheap rations from the most abundant materials. Due care must be exercised at all times to avoid exclusiveness in compounding rations.

It is assumed that every farmer who feeds for butter will use a cow having a tendency in that direction, and that he will apply the test of market quality as well as the daily aggregate of butter fat in ascertaining what animals in his herd come nearest to this description. Quality and success do not depend on luck or chance. There is a "reason why" in all things. The reason is intelligible to all who desire to learn.

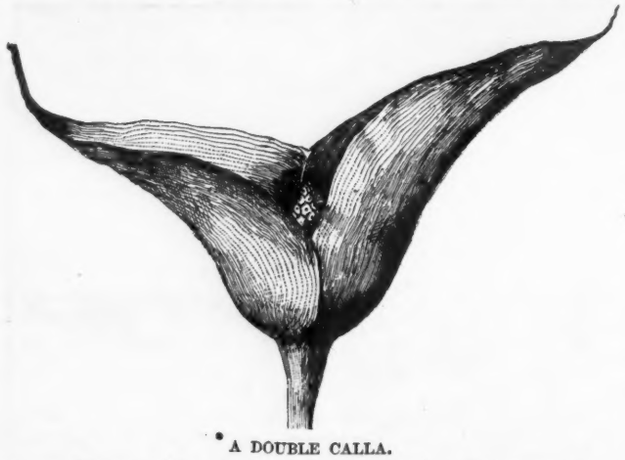
Value of Corn Fodder to the Dairyman.—Of course no more can be in the silo than is put in, and analyses of ensilage so far show that there is little, if any, gain in the digestive value of food from siloing. The feeding experiments and analyses made at the New Jersey, Wisconsin, and other agricultural experiment stations show that siloing, very slightly, if at all, increases the palatability or actual value of corn fodder as food. If equal quantities of corn fodder are taken and one well cured and the other siloed, they are equally well eaten by cattle an the products are of substantially the same value. Hence the popularity of the silo and of siloing largely rests on the more economical preservation of the fodder; and the degree of that popularity shows plainly that our methods of dry curing corn fodder were so wasteful that we realized only a fraction of its value. Prof. Henry has found by actual trials that a good Wisconsin yield of fodder from one acre (12,250 pounds) with 3,750 pounds of bran and 2,250 pounds of corn meal, will make 500 pounds of butter, with cows capable of making 250 pounds of butter per year. The prices of meal, bran and butter will vary with the locality, but in few cases will they be such that a computation on the basis of the above statements will not show that the fodder has a surprising value. If the silo has shown us the real value of corn fodder, the study and money put in silos and siloing have been well spent, and the information gained worth its cost.



OUR NORTH-WESTERN WHEAT FIELDS.

DOUBLE CALLAS.

Those who have studied double flowers are aware that they are, as a general thing, produced from single flowers, either by producing a greater number of petals than occur in the single flower, or by the conversion of the stamens, pistils or other organs, which are distinct enough in the single flower, into petals. Both methods may be observed in the rose. Some flowers with the corolla all in one piece as the *Stramoniums*, *Petunias* and others, become double by the formation of a second corolla within the first.



A DOUBLE CALLA.

If a sunflower, aster, or zinnia be examined, what passes for a flower and is usually called so is really a head of flowers. Examine one of these; the center is filled with small blackish florets, which are tubular in shape and end in fine teeth or points. These are crowded very closely upon the *disk*, which is flat in the sunflower, and is a conical body in the zinnia. Surrounding the disk, no matter what its shape, is a row of long, flat petals, usually bright yellow, and together forming the *ray* and singly called ray-florets. The doubling in these flowers consists in the production of ray flowers in the place of disk-florets. These are the principal changes that take place in the production of double flowers, and it will be found interesting to trace the changes in other flowers than those we have mentioned. There are some plants in which the showy portion, and that for which it is cultivated, is not the flower. In the Jack-in-the-Pulpit family are some brilliant plants which are used for the decoration of the greenhouse in summer and the ornamentation of fountains and other artificial water.

Other plants, the showy portion of which is not the flowers, are the well known callas, the calla lily, or African lily. The plant well known as calla is now properly called *Richardia*, and instead of *Calla Æthiopica*, should be called *Richardia Africana*. It has been a popular greenhouse and window plant for over one hundred years. It produces a large leafy body, flat and spreading nearly at right angles with the stem, with its upper surface of the purest, brightest white. This is popularly taken for the flower, but it is not a flower. To find the true flowers we must look within this white expansion and we shall find a prolongation of the stem as a yellow, spindle like affair, to which the flowers are attached. The flowers are of two kinds, both very simple in structure, the male consisting of stamens only; the fertile of pistils only. These are attached in several rows; the pistils start below and the stamens above. The small stem to which they are attached is termed the *spadix*. What is this which is called the flower, but which is not? will be asked. Botanically, it is a *spathe*, a *bract* or flower-leaf, having for its use to protect the small flowers within. No more need be said to show that this is in no sense a flower, but only an appendage to several flowers. There have been several cases recorded in which more than one spathe has been produced upon the calla. Two spathes, and in a number of cases three, have been formed, but these were at a long distance apart upon the stem. The effect was that of a monstrosity rather than an attempt at doubling, as all symmetry was lost. There is another related flower not rare in cultivation, *Richardia maculata*, of which the spathe is much shorter and of different shape, and as the name *maculata* implies, is spotted. Recently, H. E. Parker, Tolland Co., Ct., sent us a specimen in which the stem produced two spathes, exactly opposite, and which appeared to be perfectly symmetrical, and would pass for a double calla, if not for a double flower. Mr. Parker informs us that this plant is disposed to sport in other ways.

PROFITABLE PAINSTAKING.

W. H. W. CAMPBELL, CALIFORNIA.

The days of easy-going farming are ended, if farming be pursued for a living or a profit. With the improved systems of transportation, by means of which fresh eggs from Europe and wheat from Asia can be laid down in New York at sharply competitive prices, the farmer must resort to painstaking and scientific effort if he desires to hold his own. Progressive farmers are waking up to this fact, both in this country and abroad. Thus far the pressure of competition is most felt, perhaps, in the older countries; hence they are somewhat in advance of us in the niceties of culture.

Here is a wheat experiment which well illustrates the importance of keen sense and painstaking on the modern farm. Mr. Mir, of France, is a farmer whose specialty is wheat. He experimented with some of the new crack varieties, and found that on his farm they did not turn out as well as in the locality of their origin. Accordingly he concluded to test selected seed from the wheats already acclimated in his neighborhood. Here is the result of this very common-sense experiment: The land on which it was tried had been manured in the autumn with superphosphate in the ratio of 260 pounds per acre, and in the following spring with nitrate of soda at the rate of 130 pounds per acre. In the subsequent autumn, 2 1-5 acres were sown with unselected wheat, and 1 1-5 acres were sown with selected grains of the same variety. The 2 1-5 acres yielded 60 1-2 bushels of wheat weighing 64.17 pounds per bushel, equivalent to 24 1-5 bushels to the acre. The 1 1-5 acres sown with selected seed yielded 49 1-2 bushels weighing 73.15 pounds per bushel, or an equivalent of 41 1-4 bushels to the acre. At the current price of wheat in his locality, Mr. Mir's painstaking yielded him an extra income on the land sown with selected seed at the rate of fourteen dollars an acre, in round numbers. To get his seed, Mr. Mir employed two methods. One was the screening of the grain, keeping for seed only the kernels which were too large to pass the screen. The other was the selection of the heaviest heads of wheat from the stoutest stalks in the field. Of these he threw away the extremities, retaining for seed only the perfected grains in the middle of the heads. It is needless to add that henceforth Mr. Mir will not concern himself so much with "improved" varieties of wheat as with careful attention to the material already in hand.

RENOVATING RUN-OUT ORCHARDS.

We often meet with an orchard of apparently healthy trees, which is practically fruitless. The owner may tell us that it formerly bore abundant crops, but of late years the trees have "run out." Why have they "run out"? They formerly gave good crops of apples. All the other land on the farm was expected to give but one good crop, but this of the orchard was made to give a crop of grain, or a crop of grass or clover, to be taken off as hay. The soil soon became tired of doing this double duty. The trees "gave out" because they were robbed of food; the first thing they need is feeding. Of course if the soil needs draining, lay the needed tiles at once, or as soon as the soil will allow. Such orchards are usually in grass; draw on a heavy dressing of manure and spread it, and, as soon as the soil is in proper condition, turn over the sod and the manure with the plow; with the hot weather the sod will decay rapidly. When this is found to be well rotted, give another plowing, and a deep one. If ashes can be had, spread a heavy coating and harrow; in the absence of ashes, harrow in a good dressing of lime. If the trunk and larger branches are covered with loose scales of old bark upon which lichens and mosses have a foot-hold, scrape off the loose bark, using a blunt, short-handled hoe as a scraper. Then in a damp time or thaw wash the trees with soft soap, made thin enough to apply with a brush. Use home-made soft soap, made with lye or potash. That sold at the stores is usually merely hard soap mixed with water and very deficient in strength and quite inferior to the home-made. Mix the soap with enough water to work readily, go over the scraped portions with it, and leave the spring rain to finish the work. In due time the bark will be found beautifully smooth and deprived of all foreign growth. The soap that has been washed into the soil will act as a useful fertilizer. Long neglected trees usually require pruning, and this must depend upon the condition of the tree. Never cut out a branch without good reason for it. If the top has become crowded, cut out enough branches to let light and air into the center; if grown one side, remove the branches needed to restore the balance. If large wounds are made, smooth the surface and paint them over with some dark-colored paint.

THE ROADSTER STALLION, JUDGE HAYES.

At the recent American Horse Show in Chicago, the first premium for aged roadster stallions was awarded to the horse Judge Hayes, this being the third successive year in which he has carried off that honor. These and other triumphs he has won were well deserved, for he is the ideal American roadster, combining the choicest standard blood with bone, substance and elegance of form. Judge Hayes was foaled in 1879; is a rich blood bay sixteen and a half hands high, and weighs thirteen hundred pounds. His sire was Robert McGregor, by Major Edsall, a son of Alexander's Abdallah. His dam was Luna, by Almont, another son of Alexander's Abdallah, and his second dam was Sallie Tee, a daughter of the same horse. While he is thus triply inbred to the great son of Rysdyk's Hambletonian, Judge Hayes can claim the blood of Pilot, Jr., and Mambrino Chief through Almont. But no point in his pedigree is more interesting to horse-breeders than his descent from Seely's American Star. The celebrity achieved by Dexter, Dictator and other sons of Clara has naturally created the impression that she was the most successful daughter of Seely's American Star for crossing with the Hambletonian family. But Robert McGregor's dam, Nancy Whitman, was a younger daughter of the same sire, and her record as a dam places her in no way second to her more celebrated half sister. Robert McGregor has a record of 2:17¼, and five of his immediate progeny have come within the "magic circle" on records from 2:16 to 2:30. Indeed, the more the Hambletonian-Star cross is studied by thoughtful breeders, the stronger ,becomes the conviction that greater credit is due to the dams than was formerly supposed.

THE PRIZE ROADSTER STALLION JUDGE HAYES.

Judge Hayes is owned by W. D. Crockett, Waukegan, Wisconsin. In addition to winning the highest honors in his class for three successive years at Chicago, the horse also took two first premiums in Wisconsin State Fair, 1884; first premium at Illinois State Fair, 1885; two first and sweepstakes premiums at the same fair in 1886. His colts have been prize-winners in the American Horse Show, and at other exhibitions. Though he possesses the choicest trotting blood, he has never been trained for speed, but has been wisely kept for breeding. He represents that useful type of horses, the true roadster, in which none of the valuable qualities are sacrificed to speed alone.

Wheat Crop of the World.—A recent number of the *Echo Agricole*, of Paris, estimates the wheat crop of the world for the year 1888 at 1,977,600,000 bushels, of which the imports in various countries will be 340,240,000 bushels and the exports 308,714,000. Of exporting countries the United States is credited with 90,000,000 bushels; Russia with 109,000,000; India with 27,000,000; the Argentine Republic and Chili with 11,000,000; and Australia with 12,000,000. Great Britain, it is estimated, will import 151,000,000 bushels and France 68,000,000. The deficit in these estimates of the "moving" crops—the difference, in fact, between the exports and imports—is about 31,500,000 bushels. This is the French estimate. An English estimate puts it at 72,000,000. Sir J. B. Lawes, in a recent publication gives the following figures: Population of Great Britain, 37,771,000; annual consumption of wheat, 213,407,000 bushels; crop, 71,580,000 bushels; seed for 2,663,000 acres, 5,326,000 bushels. Deducting the amount required for seed from the aggregate crop, and deducting this from the aggregate consumption and there remains 147,153,000 bushels as the import, which is within three millions of the estimate of the *Echo Agricole*. The French journal places the wheat crop of the world at about 86,000,000 bushels less than the returns for 1887, and about 50,000,000 bushels below that of 1886 and of 1885.

The Cardinal Flower (*Lobelia cardinalis*).—Were this most brilliant native flower an exotic, and costly, we should see it in our gardens much more frequently than we do at present. A correspondent of an English journal says: "For brilliancy of foliage and flower, the *Lobelia cardinalis* is almost unsurpassed. Raised from seed, I find the red Iresine-like foliage varies a good deal, as many of the plants come green, and others only colored slightly, but a good percentage remains true, and these should always be kept for stock." This writer evidently has not the Cardinal Flower at all, but he is writing of an allied species, *Lobelia fulgens* from Mexico, with maroon-colored foliage; we have both species growing side by side and give the preference to the Cardinal Flower. We once had a large bed of seedlings from select wild seeds. As the plants were coming into flower some changes in the garden made it necessary to break up the bed. Some of the plants in this bed of seedlings showed a tendency to vary, and we have seen growing wild a pink flower and a pure white one. This seems to offer much encouragement to the amateur to experiment in raising seedlings. Though this plant in its wild state is found in moist places, when transferred to good garden soil it appears to enjoy the change. Some of the European florists have by hybridizing and crossing produced several varieties, but none of these that we have tried has been equal to the best forms of the Cardinal Flower.

SUGAR CULTURE IN BRITISH GUIANA.

E. J. M. CLEMENS, DEMERARA.

The district of Demerara has given its name to the entire merchantable produce of the most northern province of the South American continent ruled by a European power. Thousands know Demerara sugar who have never given a thought to a Guiana cane field; if there be such among the readers of the AMERICAN AGRICULTURIST, I invite them to a pleasant diversion. Turn from your Demerara sweetened coffee, and, under the conduct of our genial host, Col. O'Meara of Her Majesty's service, take a gallop this bright, midwinter morning over one of the many plantations that cover the South American territory guarded by the British lion. You need have no fear of encountering barbaric tongues, as English is more generally spoken than in the Dominion of Canada. Mixed with this English colony, and essential to its existence, is a much more numerous race, the descendants of the negro slaves whose emancipation made the first day of August memorable as the Jubilee of Liberty. Until within a few years these were the sole laborers and commanded about $1 per day as wages. Now they get only half as much. These other dark-browed sons and daughters of toil, diminutive in size, undemonstrative in action, patiently plodding in manner, are coolies brought from British India to meet the demand for cheaper labor. Each one is indentured to the planters by the British government for a term of five years, at the rate of one English shilling per day. When this term has expired, they are entitled to a free passage back to India. In case of unjust treatment from their employers they have redress through the British government, which indentures none of its Indian subjects save in its own dependencies, where it can enforce their rights.

The entire surface of British Guiana is low and flat, rarely rising more than one foot above sea level, and often falling so much below it as to need the protection of dams or dikes. As a rule the plantations are large, often containing several thousand acres. Whether large or small, each is divided into two equal or nearly equal parts, which are again subdivided at convenient intervals by trenches or canals, called "mains," two feet deep and ten feet wide, all converging to the plantation buildings. Owing to the low surface of the land these mains are always full of water from the ocean. On them are towed flat-bottomed wrought iron sculls, rounded at the prow. These boats supersede all necessity for carts in taking the ready cane to the mills. A single mule will tow from six to ten of these sculls, each loaded its full two feet of depth. The sections between the mains are again divided into beds twenty feet wide by open ditches one foot wide and half as deep, scooped out with a shovel that leaves the bottom rounded downward. These are to carry off surplus surface water.

One-half of the plantation is cut and replanted in June, the other half in December; thus two crops are harvested annually from the two sections, each producing one. The preparation of the soil, planting and cultivating the crop, are all done by coolies, who work in gangs of fifty. Each gang has a negro driver, and all the drivers are subject to an overseer, "who is usually a young Englishman fond of life in the saddle, and may be the son of a gentleman." As soon as a crop has been removed cooly women begin clearing away the refuse leaves and tassels into compost heaps, and cooly men begin plowing the beds. This is done with a peculiarly shaped spade made in England, of which the blade is one foot and the handle six feet long. It is thrust into the rich black loam solely by the force of the hand, its upper edge being too sharp to allow of any added impulse from the foot.

Although some attempts have been made to improve on the indigenous cane by introducing varieties from Egypt, it is still the sort in general cultivation. It attains a height of from eight to ten feet, or about twenty joints, before tasseling. The leaves on only the three upper joints are persistent. This section, severed from the stalk six inches below the first tuft of leaves, is the slip saved for the next planting. The ground having been duly plowed, these slips are set in squares two feet apart each way, and are sunk in the earth six inches, or until the first joint is covered. This slip multiplies to six or eight stalks, spreading out from the root. Cooly women give the crop one thorough hoeing, scraping all weeds into the centers of the row, then mix them with the composted leaves and hill them around the roots. This is done when the stalks are about two feet high. After attaining a height of four feet, it would be impossible to work among them without injury to the plants. At this stage and later they present a tangled aspect of dark glossy leaves pleasing to the eye. In from nine to ten months the full height is reached, and the tassel stem begins to shoot. Two weeks later the tassel itself appears, at first of a silver gray color, but as it expands, turning to pure white, presenting the appearance of a magnificent plume or cluster of plumes four feet long. Ten thousand acres of these nodding plumes! What earthly pageant could compare with it? In from six to eight weeks after the tassel begins to shoot it drops or turns gray, which is an indication that the cane is ripe. Then come the negro cutters each with a strong knife, sharp on one side and the reverse point. Each cutter passing between them takes two rows at once, cutting first on one side of him and then on the other. One dexterous slash with the broadside of the knife severs the cane near the roots; a back-handed stroke with the reverse point cuts off the top. These drop on the ground and await the women's gathering; those are laid in armful piles and carried by negroes to the sculls in waiting; and the round of spading and planting begins anew.

We follow the canes to the mill, see them fed to the relentless cylinder that crushes from them their life blood, and hear it pass in gurgling streams through pipes into the boilers that transform it into sirup; then by the help of the French *effete*, which has superseded the time-honored copper kettles, it is reduced to a saccharine mass. We linger a moment to see this mass hurled through the sieve-sided revolving open pan, filling the outer concentric stationary pan with a heap of snowy whiteness, think how the Portuguese traders will "doctor" it with sand for the southern markets, breathe one regretful sigh as we imagine ourselves stirring the fragrant coffee, give reins to our horses, and, between the purple green beds of the next half year's reaping, turn from the heat of the tropical sun to the ever grateful siesta.

WIRE AS A FARM CONVENIENCE.

W. E. PARTRIDGE.

Soft steel galvanized wire, such as is used for the cheap telephones, is wonderfully useful about the house or the farm. With a good pair of pliers, it can be used almost like string. When this cannot be had, common copper wire will answer just as well, but is a trifle more expensive and not as strong. In the absence of these the soft iron wire used by stove men for putting up stove pipe will answer. The latter, however, is rather large. Having either of these soft wires we may sew a button upon stiff cloth, fasten the ear of a tin pail in place, or bind a volume of periodicals. With the copper wire leather can be fastened in many places, as for example about a harness where ordinary waxed ends will fail. For training plants against the house wire is far better than string. For this purpose copper is first, the galvanized second, and plain iron wire last. Old fence wire may be worked in for this purpose. In the garden two or three strands of it can be made partly, if not entirely, to take the place of brush for peas. A pretty stout stake is wanted at each end of the row. Tomatoes can be supported by a pair of wires stretched along the row, one on each side. This must be done early before the vines begin to spread at the top. An old barrel hoop may be fastened to the wires so that the plant comes up through it. In the pocket of the buggy and the farm wagon,—in fact, in every carriage on the place,—there should be a small roll of wire, as well as a ball of stout string. In the event of a break-down all sorts of mending can be done with great ease. A broken strap, thill, or even a tug, can be made whole, and accidents which are usually seriously vexatious become mere incidents.

Wire wound tightly about the end of a stick, and the ends carefully tucked in, or the last turn secured with a tack, makes a good and substantial ferrule. To learn how this should be done one has only to study the winding of wire upon a broom. This broom wire is of about the right size for all the smaller jobs. There are places and times when a couple of turns of wire around the mouth of a bag are much better than string. A wire staple or band will hold a flapping strap, and without showing like a string. A stretched wire will keep flower pots from blowing off a bench or shelf in summer. A split knife-handle may be wound with wire and made to do good work. It must not be forgotten that a handle tightly wound with copper wire affords a very firm grip. Lastly, when your suspenders break, and needles and thread are a mile away, don't forget the copper wire.

More Feed for Heavier Swine.—Taking the amount of food required to make a pound of gain on swine weighing thirty-five pounds, 3.3 per cent more food is required by swine weighing seventy pounds, 14 per cent more by swine weighing 125 pounds, 19 per

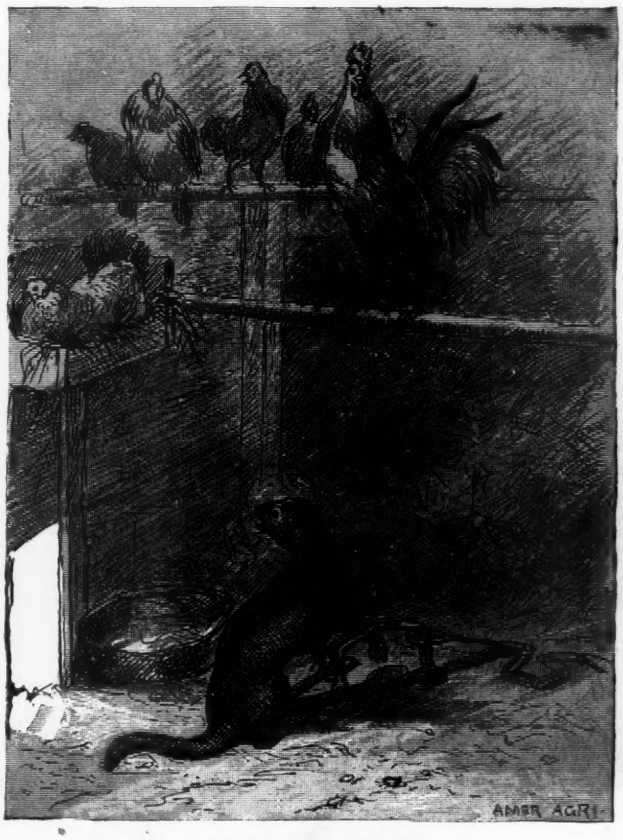
cent more by swine weighing 175 pounds, 22 per cent more by swine weighing 220 pounds, 55 per cent more by swine weighing 270 pounds, and 84 per cent more by swine weighing 325 pounds.

TREATMENT OF POULTRY DISEASES.

MISS E. K. WINANS, NEW JERSEY.

Chicken diseases are to be cured in the same way and by the same medicines as man's. When we have a case to deal with, the question is merely whether one is willing to give the needed time, care and remedies.

Broken legs or wings, distended crops and injured feet can be attended to in any quiet corner of the out-buildings, and are worth curing even from the most matter-of-fact point of view. Broken limbs should be set with little splints, and the bird kept quiet for two or three weeks. If a great dose of castor oil and careful kneading of a hard crop fail to empty it, cut through to the mass of food, take it out, wash the crop with carbolic acid diluted with water, blood warm, and sew up crop and outside skin separately. Keep the fowl still, feed it nothing for a day, and only milk and gruel for a week. Cocks which have been badly hurt in fighting should be bathed in warm water and kept quiet; they are likely to have fever. Fowls that have been cured of these afflictions are almost always grateful—disagreeably so, for they persistently follow their surgeon about. It is a more serious thing when one of the many forms of roup shows itself. Then indeed one must be sure that there is a place for a hospital, really safe from the other chickens and from human children. Many physicians believe that the kind of roup which is similar to diphtheria is contagious to children. I do not share that belief; at least, I have never known such a case, but wiser people than I think cankered chickens are dangerous neighbors. If one has many fowls, there should be two hospital rooms in case of an outbreak of a contagious disease, one for doubtful cases and the other for unmistakable ones. The rooms should be so built that they may be thoroughly fumigated and washed with disinfectants after the epidemic is over. In warm weather tents of coarse muslin which can be washed and dried, are good. There are throat and lung diseases of chickens which are not contagious but they all have a wretched way of running into roup. One should watch to see which form of roup it is and then fight it in its weak points either to grim death or health and strength. It is not wise to try for more than ten days to cure a roup case. If by that time it is not much better there is little hope of recovery and it is more merciful to have the chicken killed. I have found most hopeless the roup that brings a curd-like lump under the eye; and most hopeful that with spots on the throat. Bichromate of potash is very efficacious as a remedy for chicken diphtheria, just as it is for people. It should be the strongest powder for this use sold in pharmacies, given dry on the tongue, in doses as large as a medium sized pea. A good course of treatment for roup is four times in twenty-four hours to give a dose of the above, and, a few minutes after, to wash head, throat and nostrils with chlorinated soda water, carbolic acid water or weak vinegar, and, if the patient will not voluntarily eat, some gruel with meat and onions in it, and a little milk punch should be given it a little later. Kerosene oil is a powerful remedy in roup, but horribly harsh. It will clear out canker, but its use is a torture to invalid and nurse. There should be drinking water, with iron in some form in it, always near roup cases, and if the chickens will not take it they must have it given them, and the same warmth, cleanliness, cheerful light, good food and milk that we need in throat diseases are necessary in the care of roup. One will probably be laughed at for tending chickens so carefully, although on a farm it would often make the difference between a good year and a bad one. Most cases of roup in well kept yards come from newly introduced poultry and it is wise to keep fresh importations apart from the other stock for at least a week. The Douglass mixture is capital to use in all the chickens' drinking water through the winter. In that case they need an extra quantity of green food. On the patients' convalescence will depend their future strength and they will need tonics, a rich diet and protection from the other chickens' bullying.



CAUGHT AT LAST.

A POULTRY PEST—THE MINK.

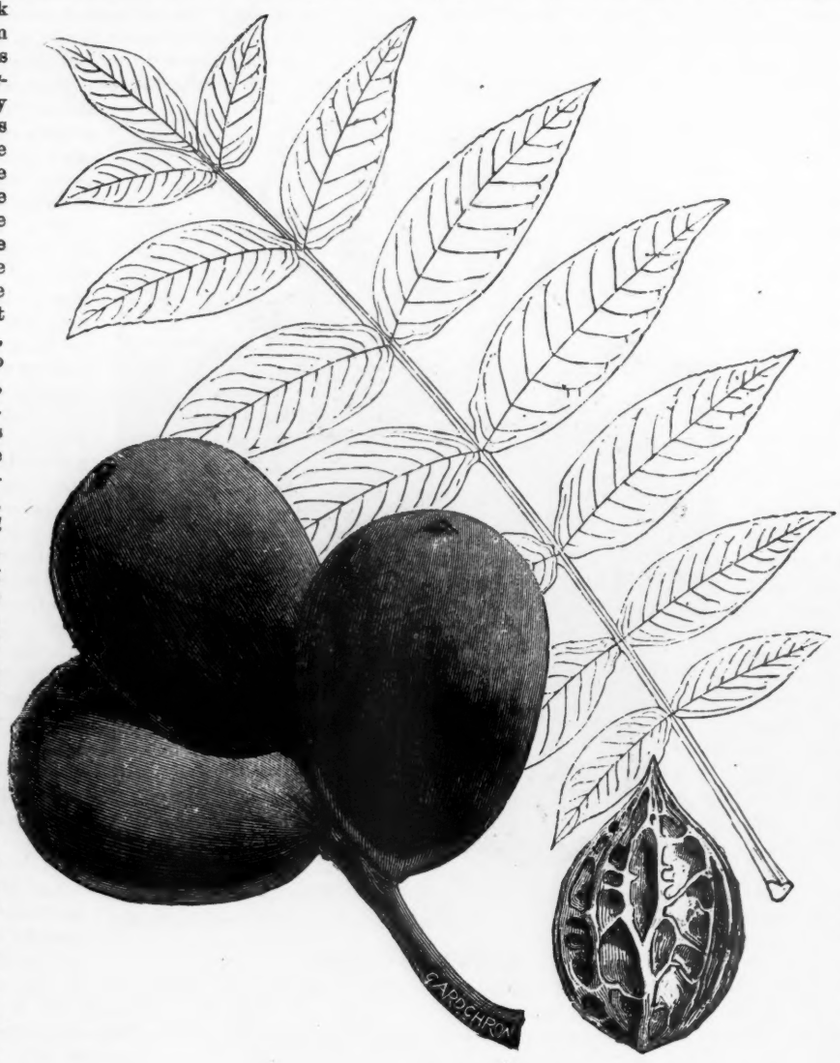
T. B. BALDWIN, TEXAS.

Of all rapacious small animals, none are more annoying to the poultry raiser than the soft-coated, nut-brown little mink. He usually dwells in a subterranean domicile, in the bank of a brook or creek, and so well protected from intrusion that it is next to impossible to interview him in his own apartments. From his abode he sallies forth on nocturnal raids to neighboring fowl houses, where he often plays sad havoc with the plump, yellow-legged pullets and cockerels the farmer is saving for market. He always cuts the throat of his victim with his sharp incisors, and makes a repast of the blood. If he is very hungry he may kill but one fowl, and after imbibing its "sanguinary fluid" he will eat a portion of the flesh. The blood is his favorite dainty, however, and if his fast has not been long protracted he will often kill five or six fowls, suck their blood, and leave their bodies unmangled. In this respect he is somewhat like the early frontiersmen of the Southwest, who used to kill half-grown wild turkeys for their hearts and livers alone, throwing all the rest of the birds away. Dainty morsels, truly, these tender hearts and livers, but what a sinful waste! The mink is much more troublesome in winter than at any other season. He usually selects a dark, often a drizzly night, in which to make his raids. If there is an opening in the fowl house through which a common-sized cat can pass, he is sure to get in and do some bloody work. One cold morning we found as many as nine good fat hens lying stiff on the floor of our fowl house. Their jugular veins were severed, and there was not a drop of blood in their bodies. As they were entirely fit to eat, we feasted on fat chicken for several days, eating all but one. We filled this one with strychnine and left her where she lay. The next morning a large mink was lying beside her, as cold and dead as the hen. After he makes a raid on a flock of poultry, a mink is sure to return the following night, or very soon thereafter, and if he finds one of his victims still lying there ready for his carnivorous appetite he will make his supper on cold meat instead of warm blood. Hence it is easy to poison him after he makes his first raid.

A better plan, however, is to capture the mink before he commits his first depredation. This can be accomplished by having only one entrance for the fowls into their house; this should be a small opening near the ground. After the fowls have gone to roost, if the night is cold and wet, and there is reason to fear a visit from a mink or other predatory lover of fowl, chain a trap securely near this opening on the inside of the house. Now set it (but do not bait it), and place it right where the mink will step as he comes in, and in nine times out of ten he will be caught. The male does most, if not all, the chicken stealing; of the dozens of these little marauders that have been caught in our fowl houses, not one was a female.

A NEW WALNUT.

Among the many plants of the Amoor region, made known by the botanical explorer Maximowicz, is a walnut, *Juglans Manchurica*, peculiar to that country. Seeds of this tree were distributed, and the tree has been tested in widely separated countries, sufficiently to show it to possess qualities to commend it to growers of nut-bearing trees. J. Van Volxem, of Brussels, a noted Belgian horticulturist, sent specimens to the *Gardeners' Chronicle* (London), from which that journal made an illustration which is here reproduced. The leaf here is much reduced in size; its real length is from thirty to thirty-two inches, and it imparts to the tree a very noble aspect. The nuts are borne in clusters of from six to thirteen. Nothing is said to the contrary, and we assume that the nuts are shown of the real size in the engraving. The nut deprived of its husk shows the points in which it mainly differs from the fruit of *Juglans regia*, generally and incorrectly, in this country known as the English walnut. The elongated point and the harder shell, with the much coarser ribs, are very different from the ordinary walnut. The common walnut is not quite hardy in Belgium, and as this ripens two or three weeks earlier, it escapes the frosts. This new walnut has borne fruit near home —at the Arnold Arboretum, Jamaica Plains, Mass. The *Garden and Forest*, in a recent issue, gives some interesting notes concerning the tree. The seeds were planted in the fall of 1879, and this year the tree bore two bushels of nuts; the tree has borne now for five years, showing a precocity remarkable in nut-bearing trees. It is generally regarded as of good promise as an ornamental tree. We find no mention made of the character of its wood. It will probably approach our black walnut in quality, and, being of such rapid growth, it will, probably, like that, be affected in quality by soil and locality. As to the quality of the nut, Dr. Masters, the English editor, and Prof. Sargent, the American, differ somewhat. The former says: "The kernel is not so good to the palate as the better kinds of walnut; but considering that these represent the effect of long ages of selection and cultivation there is reason to hope that the Manchurian walnut may be improved in like way." Prof. Sargent says the kernel is "of very good flavor. The tree being so much more hardy than the common European walnut, it is expected that it will prove a useful stock upon which to work the finer varieties of that nut."



THE MANCHURIAN WALNUT.

The Cheapest Growth is made on young animals; after the maturing period the cost of gain increases rapidly. If we double the time needed to grow a hog, about three-fourths of the food is used for maintenance, whereas but little more than one-half of the food need go for maintenance. By doubling the time of feeding we halve the profit of feeding.

ENSILAGE AND HOLSTEINS PREFERRED FOR THE DAIRY.

HENRY FOSTER, NEW YORK.

I prefer feeding with ensilage because, after eight years experience with the silo, my cows do better every way than they did with the old system of feeding. They are in better flesh, sleek and happier than they were before. I do not have the trouble in calving, and from milk fever, that I used to have. The yield of milk and butter is much larger, and better in quality. My cows give about the same quantity and quality of milk in winter as in summer, and it costs me far less to keep my herd, on the ensilage system, than it did on hay and pasturing.

I prefer Holsteins for the dairy because they are a hardier cow, not so liable to disease, and quite as gentle as the Jersey. They give more milk and, per cow, yield quite as much butter as the Jerseys, and when they come to the shambles they make first quality beef and a large amount of it. In order to test the matter fairly, eight years ago I bought a number of registered pure blood Holsteins, also a lot of pure blood registered Jerseys, the prices ranging about the same as for the Holsteins. I have kept them all in the same barn and have given them the same feed and treatment. The Holsteins have beaten the Jerseys both in milk and butter. They have consumed a little more food, but the difference is a trifle when compared with the larger yield of the Holsteins. I also have a pure line of registered Ayrshires and find them more profitable than the Jerseys, but not equal to the Holsteins. There is quite as much difference in the strains of Holstein cows as in the Jerseys. Some are no better than the ordinary scrub cow in either breed. One word more with regard to ensilage. I am persuaded that many have not made a success in its use, because they have not stored it in properly built silos; also because they have not used proper seed corn, and have not grown it properly. The Southern white or sweet corn is the best for seed, and it should be drilled in rows three and one-half feet, and the stalks about eight inches apart. It should not be harvested until between the roasting ear and sere, and put into the silo in dry weather, and finely cut, and allowed to heat to 125° before weighting. Then, if weighted about two hundred pounds to the square foot, it will come out sweet and succulent as when put into the silo. Stock will eat it with avidity, and keep as healthy and happy as in a fresh pasture. Of course, the same amount of mill feed or grain should be given as when the cows are fed with hay.

[The great practical value of Dr. Foster's experience will be better appreciated when it is known that his herd comprises one hundred and fifty head, and that butter as well as milk is the object of his farming. The finest quality of both are required, as the farm supplies Dr. Foster's great sanitarium, with its four hundred inmates. The enormous barn contains eight stone silos, each

with a capacity of one hundred tons. Two larger silos, of timber, in another barn, kept the ensilage fully as well as the stone silos. Over one hundred acres of corn was grown the past season to fill these pits. This is probably the largest ensilage farm in the State.]

IMPROVEMENT IN CHRYSANTHEMUMS.

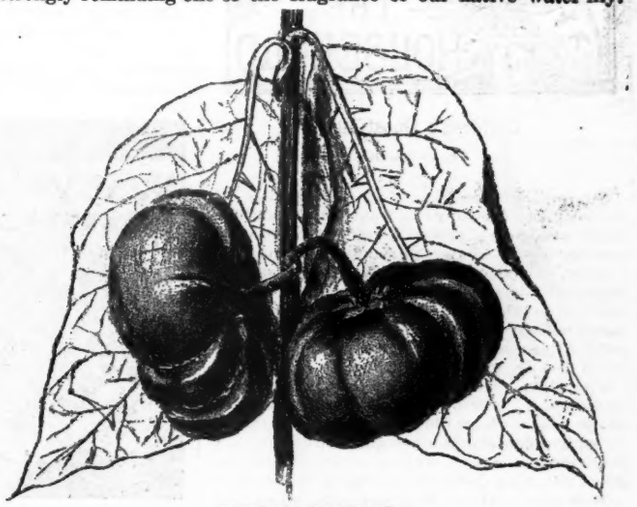
In no class of flowers has improvement been so rapid and wonderful as in the chrysanthemum. In less than fifty years the small, insignificent, so-called "Artemisia" of former gardens has been developed into the gorgeous, many-hued, graceful chrysanthemum of the present day. With the single exception of the rose, it possesses now a firmer hold upon popular favor than any other flower.

The range of color in these flowers is very wide, from the purest white to the deepest velvet maroon, and through all imaginable shades of yellow, orange, pink, brown, bronze, buff, purple and crimson. Tints which a few years ago were but faintly perceptible have gradually been developed into clear and decided shades. In diversity of form the chrysanthemum is not equaled by any other flower. While there are several distinct classes of very decided characteristics, the continuous intermixing of types has been so prolific of new forms that the number of variations in shape as well as color has become limitless. The slightest peculiarities in individual flowers will, in the hands of the skillful propagator, often form the basis of new types. Our illustration shows the now famous "Mrs. Alpheus Hardy," recently introduced from Japan and owned by Messrs. Pitcher & Manda, Short Hills, N. J. It is pure white, and differs from all other varieties in that its large, incurved petals are set with long, slender, white hairs, giving the flower a most graceful appearance.

As a decorative flower, for personal adornment as well as for the embellishment of rooms, the chrysanthemum is especially valuable, not only for its intrinsic beauty of form and variety of color, but also on account of its remarkable keeping quality. A bunch of cut flowers can easily be kept in water in good condition for two weeks. By developing both early and late varieties, the flowering season has been extended, so that flowers may now be had as early as August, while the later and hardier kinds do not bloom before November, and are not injured by several degrees of frost.

CHRYSANTHEMUM, MRS. ALPHEUS HARDY.

All that seemed lacking to make the chrysanthemum perfect was fragrance, and this has now been attained in the new seedling Nymphæ, exhibited by H. W. Hales, of Ridgewood, N. J., at the recent New York chrysanthemum show. The flowers are from one and a half to two inches in diameter, pure white, and sweet-scented, strongly reminding one of the fragrance of our native water lily.



TOMATO EGG-PLANT.

No wonder that a flower endowed with so many sterling qualities, and with the possibility of still greater developments in its constitution is making enthusiastic friends everywhere, and that brilliant exhibitions solely devoted to it are held in almost every large city in the land. The chrysanthemum, while it reaches its highest perfection in the hands of the skillful professional grower, is pre-eminently the flower for the masses. Of easy culture in the open border as well as the window garden, it is destined to find a place in every rural home where beautiful flowers are appreciated.

THE TOMATO EGG-PLANT.

Our engraving represents a curious new plant which attracted a large share of attention at the last Burlington county, N. J., fair, where it was exhibited by B. F. Bishop, in the collection of the "Progressive Farmers' Club." The plant has the general appearance of a common egg-plant, while its fruit, when ripe, resembles a medium sized, ribbed tomato. Its skin is very glossy and bright red, much like that of a Cayenne pepper. The history of the plant, so far as we could learn, is that the year before last a single specimen of it came up among a large number of Black Pekin egg-plants, growing in Southern New Jersey. The specimen from which our illustration (representing the fruits and leaves one-third natural size) was drawn, was raised from seeds of this original plant. The flesh of the fruit is very solid and dry, apparently unfit for use, but as a curiosity and ornament the plant is worthy of a trial by those in search of unusual novelties. The cultivation of the plant is the same as that of the common egg-plant.

The Pearl Fisheries of India.—There are extensive beds of pearl-oysters in the Gulf of Manaar, between India and the Island of Ceylon. The oysters cover an area of coral reef five miles long and about two miles wide, and in some places are clustered one above another knee deep. It is estimated that this year the Ceylon banks will contain two hundred millions, and the Indian banks nine hundred millions of pearl oysters. The divers go down to a depth of eight fathoms, or forty-eight feet of water, where they remain for nearly a minute, and pick up as many shells as possible, putting them into a small net which is fastened to their belt. They wear no diving-dress, but have a large stone attached to one foot by a loop of rope. When the diver gives the signal by pulling the rope he is quickly hauled up with the net and its contents. The best divers cannot remain below more than eighty seconds, and few are able to exceed sixty seconds, without "a breath of fresh air."

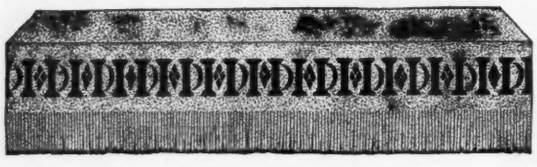
Children's Questions.

J. VILAS BLAKE.

Questioning is the basis of all conversation. If you imagine a company who want to know nothing either about each other or anything else, what possible motive can you conceive for one of them uttering a syllable? Perhaps it might be said that the wish to show off is a more potent motive in human nature than the desire to learn. But that would not account for the listeners, as questioning will. After a man has asked a question, he must listen perforce to the answer.

It is plain, therefore, that conversation begins in questions. Now no little proof of this, as well as the most striking illustration of it, is the activity with which children ask questions when they begin to talk. Indeed, we may say before they begin to talk, for a child's eyes are perpetually round with wonder, and may be described as united with the nose in a kind of double interrogation point. Therefore, the moment their tongues are loosed, the questions that have been cramming in them from the beginning pour out in a stream.

It is no little part of the science and art of living to know how to deal with children's questions. But this settles down to one point—what to do with the stupid questions. The bright questions will take care of themselves, for either you will satisfy the child by answering him, or he will more than satisfy you by nonplusing you with your ignorance. But the stupid questions, the dull, wearying, unthinking, provoking, lazy, strolling ques-



A FELT LAMBREQUIN.

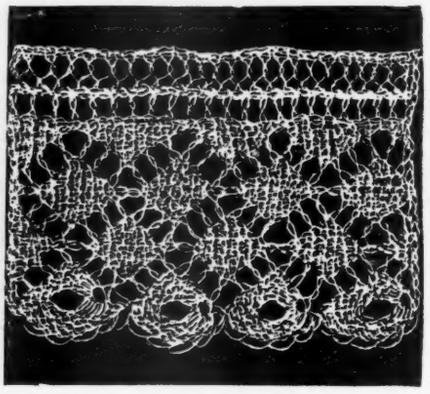
tions, what shall be done with them? Well, when a child asks a stupid question I find four ways to deal with him.

The first way is to answer the question. That is the easiest way for you—at least sometimes; for often it happens that one such question is but the uncorking of a bottle-full of them. But this method by no means is the best for the child, for it simply weakens his intelligence at every repetition. To answer a child a question which he ought never to have asked, since it is stupid, and plain to his own mind if he will but open it, is the same thing as to give him a crutch that he may hobble along when he has two good feet to walk with.

The second way is to express your contempt for the question and say no more. Perhaps this is the most gratifying of all ways—I mean to yourself, not to the child—because it lets out the temper which stupid questions provoke. Nothing is more uncomfortable for a time than to pen up vexation. Virgil represents Æolus as having a rather hard time with his winds, and although he locks them up in their caves they keep up such a roaring there that he is not likely to forget what they are. So it is when a man becomes an Æolus over his own gusts of temper. But however it pleases him to let out the temper, it is not good for the child. To answer a stupid question with simple contempt is to shock and mortify the child, to repress his mind and bring him to a stand-still.

The third way is to make the stupid question an occasion of discipline. You may set the child down sternly to work at it till he solves it for himself. This plan has some good points, the most obvious of which is that it compels the child to help himself. It is the exact opposite of giving him a crutch. It is obliging him to walk with one stiff leg till he limbers it. But the plan has one grave objection, namely, that it is likely to stop the questioning. If the child finds that the result of a question is to settle him abruptly in a corner to stay there monotonously till he thinks out the answer for himself, however he may bestir his mind for the occasion, it is probable that he will spend part of the time coming to the decision never to ask another question; and it is certain his mind will gain little activity by that process.

The way to meet a stupid question is to say calmly and kindly that the question is thoughtless. Point out to the child that it is as weak a thing in him to ask such a question as it would be to hold up one



DIAMOND LACE.

foot in his hand and then ask how he could walk. In other words, tell him he has asked a thing of you which his own mind ought to give him, and that is the same thing as to be a miserable beggar. Then set him to the task of solving the question for himself. Then follow it up with a little talk; make it the subject for a scrap of pleasing information or conversation. Be careful not to answer the question; make the child do that; but lead off from it to relations, or principles, or facts which the child cannot be expected to know. This will incite and demand the mental operation that is possible to the child; it will require the thought rightfully due from him; but also by the reward that comes and the interest that is awakened it will keep open the way for other questions, and will improve the quality of the questions in time, and will create a companionship as blessed to the parent as to the child. A little reflection will convince you that it is frequently better for the child to do his own thinking.

Diamond Lace with Open Shell Border.

Cast on twenty-one stitches, knit twice across plain.

First row—Knit three, over, narrow, knit three, over, knit one, over, narrow, knit three, narrow, over, knit three.

Second row—Over, knit all but three plain, over, narrow, knit one.

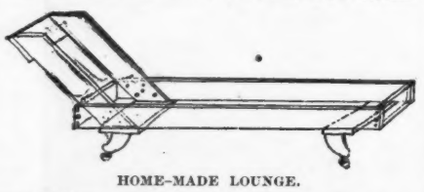
Every alternate row like second except the tenth row, which is given.

Third row—Knit three, over, narrow, over, narrow, knit one, narrow, over, knit three, over, narrow, knit one, narrow, over, knit five.

Fifth row—Knit three, over, narrow, over, narrow, narrow, over, knit five, over, slip one, narrow, pass slipped stitch over, over, knit seven.

Seventh row—Knit three, over, narrow, over, knit three together, over, narrow, knit three, narrow, over, knit one, over, knit nine.

Ninth row—Knit three, over, narrow, over, narrow, knit one, over, narrow, knit one, narrow, over, knit three, over, knit three, narrow, over twice, narrow, knit three.



HOME-MADE LOUNGE.

Tenth row—Over, knit five, purl one, all the rest plain but last three stitches, over, narrow, knit one.

Eleventh row—Knit three, over, narrow, over, narrow, knit two, over, slip one, narrow, pass slipped stitch over, over, knit five, over, knit one; slip eight of the remaining ten stitches on the left hand needle over the last stitch on the other needle, narrow.

Knit twelfth row same as second, then begin again at first row.

Lambrequin of Tan-Colored Felt.

The idea desired to be conveyed in our engraving cannot be well represented in black and white. The lambrequin is made of tan-colored felt. The pattern is first cut out with a sharp pen-knife; the broad satin ribbon is drawn through the slits as shown in the engraving. Any color can be used with the tan. This pattern is very effective, and when examined closely will be found very simple. Many different designs can be used in the manner shown herewith for tablecloths, scarfs, pillow rests, and anything where felt is used. The fringe is made by cutting the edge of the felt into strips a quarter of an inch wide. A piece of felt the color of the ribbon is cut to correspond and basted underneath.

A Lounge for a Dollar.

To make a lounge, the material for which may be had for one dollar, take two strips of wood, eighteen feet long, four inches wide and one inch thick. From one of these cut two pieces, each six feet long, for the sides, and two pieces two and a half feet long for the ends. Put them together strongly, using screws, and making a gimlet hole to start each screw, in order not to split the wood. Two more pieces two and a half feet long, from the second strip, for the head, cut as shown in the diagram. These are screwed on the inside of the frame, at one end, giving them a comfortable slant. Another piece, two feet four inches long, is fastened to the ends of the "head-pieces." On the under side of the body frame fasten two more strips, two and one-half feet by four inches, each about six inches from the end of the frame, and in these drill a hole about two inches from each end, into which put casters. On the inside of the sides, on the lower edge, fasten strips of wood about an inch square, and on these lay thin boards, over which tack a piece of bagging, treating the head in the same way. Stuff this frame with hay, piling it up about a foot above the sides, and over this stretch some muslin, drawing it as tight as possible, and tacking it firmly on the under side of the lounge. Over this tack the final covering of pretty cretonne which costs twelve cents a yard, using about three yards. If you choose to make the lounge more expensive and, of course, more comfortable, stuff it with hay on the bottom, and excelsior on top, and make a pillow of the same material, though it is not necessary. This lounge, which is more of a "divan" than a lounge, may look too low, or too hard, but it will be one of the most comfortable articles of furniture in the house. If half a dozen springs are used, they will improve it greatly.

VINE.

Embroidered Vine for Border or Bands.

This little vine will be found useful for decorating fancy articles for home adornment, for bands or borders in white or colors, for a lady's wardrobe, or for beautifying baby's apparel. Such designs are also embroidered or painted on bands of ribbon for fancy patchwork. It needs no description, as those who are accustomed to such work can readily judge what stitch will best answer their purpose and what material to employ in its reproduction.

When Farmer George Gets Blue.

On one of the model farms in Central New York lives Farmer George. He has a thousand reasons for

being continually happy, but at times when there are difficulties to overcome and the future is not quite clear he gives way to melancholy and speaks only words of hopelessness. His sister-in-law with a ready tongue gets unhappy too, and adds a word. Then another sister-in-law will lose her cheerfulness and join the croakers. Farmer George gets bluer and bluer and the girls try to be still more melancholy, while they join in doleful sentences and long faces. But forty hours of this is enough

FIG. 1. REVOLVING BOOK-CASE.

for Mrs. Farmer George. She gets them all together, stops her work and rises in power to say, "Enough for me. No more of this blue nonsense! Quit right off here all of you!" and all is peace.

Ornamental Frame for Photograph.

Some of the most artistic articles seen nowadays in home decoration are founded on the plainest of materials. The frame shown in the illustration for a photograph is made of cream-colored linen, and is extremely pretty. It is intended to rest on a small gilt easel. For the foundation, cut a frame, the desired size, out of heavy paste-board; then cut the linen an inch larger on all sides; draw a line around the opening in the center of the paste-board on the linen but do not cut it; mark it on the right side with a thread. The cobwebs are worked in a long stitch with silk, in the natural color. Use pale green for the wheat leaves, and yellow for the heads. Draw the covering smoothly over the paste-board and glue it down on the back. Cut the opening, leaving an inch to turn over on the back, and glue down. Cover a piece of paste-board of similar size with the linen and over-hand the two together on the sides and bottom, leaving the top open to slip in the photograph.

Home-Made Revolving Book-Case.

The accompanying illustrations, from drawings by Mr. Webb Donnell, Maine, show a convenient and easily constructed revolving book-case, which can be made by any one of average mechanical ability. Fig. 1 shows the book-case complete, and the other engravings the details. The stand, Fig. 2, consists of two cross-pieces two feet long and an inch and a half thick, into the junction of which is fixed a round upright three feet long and one inch in diameter. The cross-pieces may be of

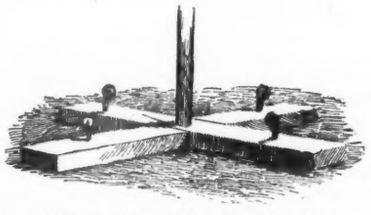


FIG. 2. STAND FOR BOOK-CASE.

maple or other hard wood. The upright must be of straight-grained white oak, or other tough, close-grained wood. A common furniture caster is fastened to each arm of the cross-pieces, six inches from the end. Fig. 3 shows the construction of each stage of the book-case. It consists of a shelf two feet square and three-quarters of an inch thick, with an inch hole in the center. Four vertical pieces are fastened edgewise to this shelf. Nine and a half inches wide and eighteen inches long are good average dimensions, but they may vary according to the size of the books which it is desired to keep upon them. The lowest shelf should be of hard wood, as it supports the entire weight resting on the casters. The rest may all be of pine or other soft wood. The two upper shelves are without holes, and have partitions only three or four inches wide, which are arranged to hold two or four drawers, as shown in the illustration.

A Dainty Room.

Every young girl likes a pretty room, a place to keep her treasures, her letters, her photographs, and the dried flowers which have such tender associations. Elegant furniture, rich carpets, costly silken and lace hangings are within the reach of only the few, of whom you may not be one, but you may none the less have a pretty room at a very small cost. A pretty creamy white matting can be bought for twenty-five cents a yard, and will last for three or four years in a bedroom. Once a month it should be wiped with warm water containing a handful of salt; this moistens it and keeps it from breaking. The AMERICAN AGRICULTURIST has told you how to make a dressing table. A breadth of an old dark-blue cloth dress, lined with coarse sacking to give it body, and embroidered in blue and cream-colored flowers will make a pretty rug. The embroidery is quickly done in crewels, and is very effective. Make a fringe from blue and cream-colored flannel, cut an eighth of an inch wide, and three inches deep. If the bedstead is only a cot, it can be robbed of its ascetic air by a ruffle of cheese cloth or chintz reaching to the floor. Swing high curtains from the ceiling like a mosquito netting, and loop them back with blue ribbons. An old-fashioned wash-stand may be bought at a second-hand store for a dollar or two. Paint this a pale yellow, and make a cover for the top of white, lined with blue, and a splasher at the back to match, with ribbon bows tacked at

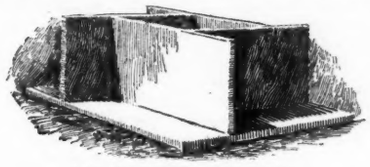


FIG. 3. TIER OF SHELVES.

either corner. A long low dry goods box, that an elder brother can fit with a cover fastened with hinges, will make a nice case to fold away dresses in, and can be made to do double duty as a lounge by stuffing the top and covering with some pretty chintz to match the prevailing colors in the room. Home-made book shelves, cheese cloth curtains at the windows, and a few engravings or etchings with rustic frames of cones or bark will complete a room that any girl might enjoy.

Sofa Pillows.

These "ever old, ever new" adjuncts of a lounge, and "wooers of sleep," are always in demand. In addition to the regular pillow (of down, nowadays, not of feathers), there should also be one of pine needles, or of rose leaves. The drowsy god Morpheus is supposed to be especially attracted by the former. Make a bag of the desired size, about ten by fifteen inches, of soft unbleached muslin, and stuff it full of the pine needles. The cover should be like a pillow slip, slightly larger, and long enough to tie at one end with a satin ribbon. This end is then fringed for an inch. Soft India silk, either plain or flowered, is an appropriate covering. If plain, work some appropriate motto on it in etching stitch, such as "Give me of thy balm, O fir." Rose leaf bags are made in the same manner.

Square sofa pillows, covered with satin or silk, with a strip of white linen over them, are new and serviceable. Only the part exposed by the linen need be of satin or silk, the rest may be of muslin of any color. The strip of linen should have a hem an inch wide, which may be hemstitched or not, according to the time you have to spend in fancy work. It must have eyelet holes worked in to admit of its being laced over the pillow with a heavy silk cord, white, or of any contrasting color. Upon one end outline in wash embroidery silk, or in French red marking cotton, "Folded eyes see brighter colors than the open ever do." These covers can be removed and laundried, which is a great advantage where a pillow is wanted for use.

Crazy Patchwork.

The mania for crazy patchwork which existed a few years ago, and the many unartistic specimens resulting from it, have for a time thrown it out of

A NEAT PHOTOGRAPH FRAME.

favor, nevertheless it may be made a source of pleasure to invalid ladies or crippled children. It offers a field in which may be developed whatever artistic fancy the maker may have. A beautiful piece of work of this kind was recently displayed at a church fair, the work of a young milliner, in her spare time. The colors were restricted to gold, white and cream only, these colors also being employed in the embroidering. It was edged with gold colored plush, a quarter of a yard wide, and lined with sateen of the same shade. An album quilt might be made very interesting, taking this for a hint. Let each friend work one square, with her name in fancy letters, and her favorite flower. This would prove of great interest in after years. If one has not a large number of friends, scatter these friendly squares through the quilt, and fill up with your own handiwork. In our mother's day it was the fashion for a set of friends to work, in fine cross-stitch, squares of canvas which were afterward joined as a border to a square of cloth or velvet for a table cover.

A White Felt Afghan.

The dainty afghan shown in our illustration is made of a square yard of cream white felt, pinked around the edge. The border is formed of yellow satin ribbon, which is run through the openings

A HANDSOME AFGHAN.

that are cut in the felt at regular intervals. The stitches done on the squares of ribbon match the color of the felt. The daisies are stamped on and made of the narrowest width of yellow gros-grain ribbon drawn in place with the aid of a large needle, one stitch forming each petal. The centers of the daisies are composed of French knots done in light brown filoselle; the leaves and stems in shades of olive. If one doesn't care to have so

much work on it, it will be found very pretty with only the border, which is made by drawing cardinal ribbon through the pattern previously cut in the felt, and fringing the ends as seen in the illustration.

Fashions in Furs.

"As the days begin to lengthen, the cold begins to strengthen," and soft warm furs are in great demand, while often the most acceptable present a lady can receive is a handsome muff and boa, a pretty fur collar, or stylish shoulder cape. These small pieces of fur, too, come at all prices and to suit any purse or taste, all the way from the costly Russian sable down through the various grades of beaver, black marten, lynx, fox, bear, badger and monkey skins to the common Russian hare, muffs of which are retailed as low as thirty-nine cents. A fashionable set of furs consists now of a very fluffy boa, long enough to touch the foot of the underskirt, and a round, full muff, somewhat larger than those carried last year. For boas, long fur is preferred, although a few flat ones of short mink, seal and beaver are shown, but they are neither so effective nor becoming as the large fluffy "snakes" wound about the neck, with the ends thrown over the shoulders. If a collar is desired, the choice lies between the Russian style—which is round behind, reaching to the shoulder-tips, while the fronts cross like a fichu and extend to the waist-line—and the shawl collar, which is short and round and simply laps in front.

With cloth suits, shoulder capes or pelerines are more liked than ever; but they should never be worn over anything that is not perfectly tight-fitting. They are both comfortable and convenient, as they can readily be put off and on, while they afford desirable protection to the chest and the sensitive place between the shoulders. In length, they should come just inside the arms when they are folded, for, if longer, they are liable to push up and look awkward; the shoulders are somewhat raised and the standing collar is cut on the cape.

The short, jaunty seal-skin jacket has almost superseded the half-long seal-skin sacque, except for elderly ladies. It is cut a trifle longer than those sold last season, fits the figure closely, is single-breasted and has either coat or bell sleeves. These jackets, if new, are generally untrimmed, though a few show a collar and revers of leopard skin or a plastron of plucked beaver. Short wraps or dolmans of seal-skin are also popular, a favorite model being the "Modjeska," which has long pointed fronts and a short back without plaits, fitting smoothly over the tournure. All seal-skin garments ments are copied in seal-skin plush which are made exactly in the same manner, while they are much less costly. The same designs also serve for cloth wrappings. For those wearing mourning, pretty fur cloaks come of Persian lamb-skin—which is often known as Astrakhan—while a few showy jackets for young ladies are made of gray krimmer to complete gray costumes or of spotted leopard which is considered extremely stylish and decidedly English.

Fur-lined circulars are useful for evening wraps and hack garments, but are no longer fashionable for dressy wear; but cloth suits, wrappings and even evening dresses are extensively trimmed with fur. Thus a tailor-fitted jacket of blue or black diagonal cloth is lovely with collar, cuffs and vest of natural beaver; while the same in black Persian lamb-skin looks well on dark red broadcloth. For trimmings, both long and short furs are used, the former serving for lengthwise rows and borderings, while the latter are set in as vests or plastrons, and laid on for revers, cuffs and caps to sleeves.

Brown furs are once more in favor and ladies are bringing out the old mink and sable sets they have had stored away and are utilizing them in various ways, while the most durable of all furs are the black and brown bear skins which often border very heavy cloths or velvets. Tail pendants, like fringe, are seen on dolmans but are never very pretty; while the fancy for combining black with all colors is carried out by trimming brown, green, red and blue cloth or plush garments with black fur, such as Russian lamb, black marten or black fox. Chinchilla is little used, its place having been taken by the gray krimmer and the skin of the Australian opossum. These soft gray furs are particularly liked for children, while very small girls wear cunning little cape coats of white, mandarin lamb-skin, with a tiny muff to match. Dainty and fashionable muffs to match costumes can be also easily made at home, by a clever girl, of ribbon and fur. These are placed in alternate rows and finished by a long-looped bow of the ribbon, set on top.

For sleighing, tobogganing and all winter sports, nothing in the world is as comfortable as a fur hood, or, if this is unobtainable, one of plush bordered with fur; while this season they promise to be the very highest style, the Princess of Wales having set the fashion. They should fit very snugly about the head and face, have a cape falling on the neck and be tied with ribbon strings beneath the chin. Young girls, however, may prefer the velvet or plush turbans, which have high, round, soft crowns folded and wrinkled, and sometimes caught over on one side, while they are finished with a border of beaver or lamb-skin.

Resolves for the New Year.

ALICE CHITTENDEN.

Of course we all want to make certain resolutions on New Year's day, even if we break them before the week is out, as most of us do; but if we look into the matter closely, we will find that we do not make them in the right spirit when they are so easily broken. In the first place, we must study ourselves, our faults and limitations, and then make such resolutions as we see will be most helpful to us to correct these, looking to One who alone is able to help us keep them.

As I am writing to women, I propose to tell them of a code made by a friend of mine, in January, 1887. She is a farmer's wife, with several children, and was a very Martha among women, "careful and troubled about many things." I will quote from her letter, which may help some of you:

"I was fast working myself into that narrow bed which must form our last rest. It was one eternal round of washing, ironing, cleaning, sewing, sweeping and baking. One day when I was fluting the ruffles of my little girls' aprons, I happened to reflect upon the probable future of my little ones if I should be taken sick or die. Probably I was then overtired, for one or other of these catastrophes seemed to be at that moment imminent. That night after I went to bed I framed in my mind a set of resolutions which I afterward wrote out. They were, that I would lie down daily, if only for fifteen minutes. That one afternoon in the week I would devote to the exchange of ideas with the outer world—I would see some friend, either in her home or mine. That three evenings in the week, in winter at least, I would read aloud, with, or without, the children—that is, sometimes for their benefit, and sometimes for my own.

"Now, in order to do this, the work must be lessened somewhere. First, I left off every ruffle and tuck from garments, little and big. This saved both sewing and ironing. Flannels, plain underclothing (and we soon had no other) were brought from the line on wash day, as soon as dry, folded neatly and hung on the horse to air without taking an iron to them at all. I have since learned that it is considered better not to iron sheets, as it takes off the sweet smell of newly washed linen. If such things are hung up straight, and then not jammed in a wad in a basket to lie over night preparatory to 'sprinkling,' there are few wrinkles that cannot be rubbed out with your two hands. Wash day remained a necessary evil, but I saved washing in every way possible. Little squares of white oilcloth were laid under the children's plates, and in summer when the men were afield, and clothing was necessarily more soiled, a long strip of this material was laid upon either side of the table. Pies, which had been on our table daily, became a rarity; cake, still more rare. Think of the saving of labor that this sacrifice meant, and my husband says it has been no sacrifice, but that on the contrary he thinks doing without these dainties has given him a new lease of life. Baking day, which once with its doughnuts and pies had been my busiest day, now became my day of leisure—comparative leisure, for I still do not luxuriate in idleness. The children are merrier and happier, because I can give them more time. My husband is more pleased, because he says I do not now look overworked, and, altogether, we are satisfied with my resolutions."

My friend could not easily have kept these resolutions without the co-operation of her husband, and, in the name of overburdened womanhood, I ask the husbands who read the AMERICAN AGRICULTURIST to be in this matter a helpmeet to their wives.

Good Home Recipes.

Snowballs.—Pare and core six apples; fill the space with a little marmalade of any kind, or sugar and spice with a bit of chopped lemon or orange peel. Place each apple in a separate cloth, and scatter over each two tablespoonfuls of rice. Tie rather loosely, and boil for one hour. For the sauce, cream a piece of butter the size of an egg with a cup of fine sugar: add the grated rind and juice of one orange, or its equivalent in any kind of fruit juice from canned fruit. Pour over slowly a pint of boiling water.

Escaloped Oysters on a Half Shell.—For a dinner party or evening company, escaloped oysters are nice, and are very pretty, served in the smooth white shells picked up on the seashore, especially along the New Jersey coast. Whether prepared in a dish or shell, the bottom is covered with crushed crackers and bits of butter; next a layer of oysters well seasoned with salt and pepper; more cracker and butter; and so on, alternating, until the dish is full, but finishing with a covering of cracker. Pour over this the oyster juice and one quart of new milk. Bake in a hot oven for half an hour.

Fricandelles.—Dishes which call for cold chicken or turkey are in order at this season of the year. Take a half pint of cold minced fowl, and an equal quantity of stale bread that has been softened in cold water; it must be just soft and moist—not soaking. Mix both together, and season with salt and cayenne. Dip the hands into cold water, and make up the meat and bread into small sausage shaped rolls, about two inches long, and one in diameter; roll them in fine cracker or bread crumbs, and fry in a kettle with smoking hot fat enough to float them; take out with a skimmer, and lay on brown paper a moment to free them from grease. Garnish with parsley or cresses and slices of lemon.

To Cook an Old Fowl.—Braising is one of the nicest ways in which to serve an old hen. If it is cold weather, let it hang for at least five days after it is dressed. Then stuff as for roasting. If you have a pair of fowls, cut a quarter of a pound of salt pork in thin slices; lay half of this in a broad saucepan, the chickens on top, and the rest of the pork skewer over their breasts, just taking up the skin, and not running the skewers through the flesh. Season with salt and pepper, and pour over a pint of boiling water; cover the saucepan closely and simmer for two hours and a half, or until they are very tender, but cook *slowly*. This is the secret of cooking all meats over the fire; they must only be simmered. When the chickens are done, lay them on a hot dish in the warming oven, and strain the gravy. Put half of it in a saucepan, and boil rapidly to a bright brown glaze, first adding a teaspoonful of flour wet with cold water. Remove the pork from the chickens, brush them over with the glaze, and brown in a quick oven. Skim the fat from the rest of the gravy; add the giblets chopped fine, and the water in which they were cooked; thicken with browned flour, and season to taste.

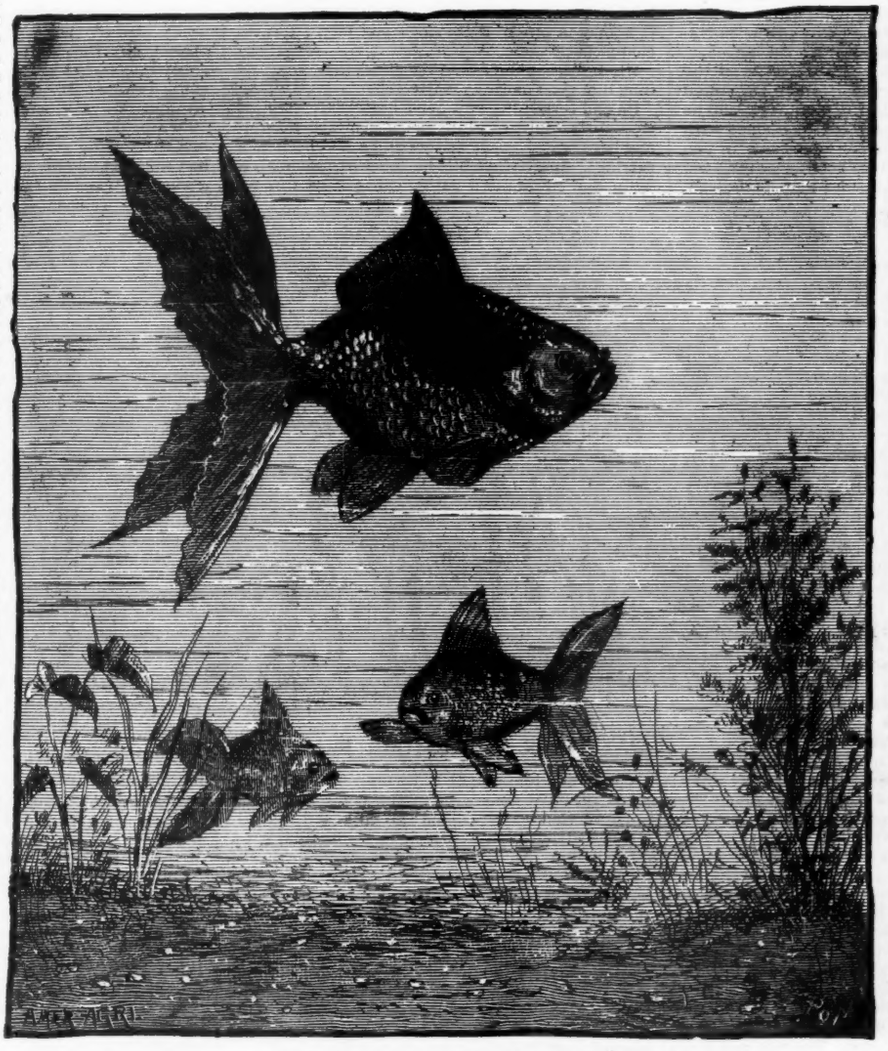
New Year's Customs.

There are few holidays the festivities of which can boast of greater antiquity than this. From the time of the Julian reformation of the calendar, the ancient Romans observed the first of January as a holiday, dedicating it, and the whole of the ensuing month, to the god Janus, from whom January takes its name. Sacrifices were offered to him on twelve altars, and they were careful to regulate their conduct on that first day so that every word and act might be a happy augury for the rest of the year. May we not learn a lesson from this custom of the heathens? On this day friends became reconciled in spite of former differences and grievances, and all strife and litigation were suspended. Visits were exchanged, and presents given and received. In our own time, this observance has been in a great measure superseded by the giving of Christmas gifts. Branches of mistletoe, cut with solemn religious ceremonies, were exchanged by the Druids, and on the first of the year the Persians exchanged presents of eggs. The custom of giving presents to royalty is as old as the Cæsars, and became such a burden to the people that Claudius limited their cost by a decree.

Henry III, of England, followed this Roman precedent of extorting gifts from his subjects, but it was in the time of Queen Elizabeth that it attained its greatest extravagance. Her wardrobe is said to have been almost wholly supplied in this way, and she in return gave presents of gold and silver plate. The custom, now happily falling into disuse, of offering wine to callers on New Year's, undoubtedly had its origin in the "Wassail Bowl." Among the early Saxons the customary phrases among friends about to drink together were, "*Was-haile*," or "*Drink-heil*," the former meaning "Be in health," and the latter "Drink health," equivalent to the "Drink hearty" of our modern barrooms. This soon became corrupted to "wassail," meaning the drink, a compound of ale, spice, sugar, toast and apples.

Japanese Gold-Fish.

Those who have seen only the common gold-fish can have no idea of the quaint and singular beauty of the Japanese varieties. They belong to the same genus as the common kind, which originated in China, but the Japanese show remarkable characteristics, partly from natural variation and partly from skillful breeding and management. The most striking features of the latter are the caudal fins or "tail," and the colors. The former is very large, double, triple or quadruple. Instead of being bright golden in color, the Japanese are brilliant vermilion, yellow and white, the latter sometimes dotted with crimson. Several of the varieties have been imported to this country, one of which, the Fantail, is shown in our engraving drawn from specimens in the establishment of a dealer in Brooklyn, N. Y. The body is elongated and compressed on the sides; the head pointed; the fins are short and stout, the anal sometimes double and occasionally found wanting. The caudal fin is comparatively short, is double, with the upper edges grown together; it is sometimes erect like that of the fantail pigeon or projects horizontally. The colors are mostly vermilion and white; in some cases the whole body is white with the exception of the abdomen, this being golden; in others the body is dark red, the belly also golden; the color of the eyes is variable. It may be mentioned here as an advantage of the double-tailed fish that they are unable to jump out of the water. This fact is undoubtedly one to be appreciated by those keeping an aquarium.



JAPANESE FANTAIL GOLD-FISH.

New Year Thoughts.

Better resolve and fail than never resolve at all.

Wisdom knows wherein to make the new year different from the old, for it knows wherein the old year was unprofitable.

Harmless amusements build a barrier around the children that shuts out the evil spirits but lets the good angels in.

Not bad luck, but bad judgment; not ill conditions, but ill thinking, make life a failure.

The good garden is begun in January with an inventory of seeds on hand, and a study of seedsmen's catalogues, with an order sheet and a pencil in hand.

When the house is burning is a bad time to recollect that the insurance has expired.

Better patronize your home grocer than buy of the traveling agents of some distant firm.

Getting the material for rabbit pies will be wholesome sport for the boys and a protection to the orchard.

It is none too early to begin the preparation of stove wood for next summer.

An ice-house now well filled is a hostage to health and pleasure next summer.

Improve your mind by thoughtful reading, and push your stock by solid feeding.

Regulating the Cellar.

The cellar should be ventilated in winter as well as in summer. In fact, as it contains more, its atmosphere is sooner contaminated in winter, and its ventilation should be more carefully attended to at this season. Advantage may well be taken of the middle of every warm day, when the air has reached a temperature of thirty-five degrees or above, to give the cellar an airing. Vegetables and fruits keep best in a temperature just above the freezing point, say from thirty-five to forty-five degrees. Should the temperature in severe weather threaten to fall below thirty-five degrees, make sure that doors and windows fit tightly. Every cellar should have double windows and double outside doors. It is fortunate if the cellar has been constructed with a fire-place, for then the temperature may be easily controlled. A pot of coals replenished as often as the coals die will have a greater effect on the temperature of the cellar than is generally supposed. Rather than have the contents of the cellar freeze, we would put a stove in the cellar, as we have seen done, running the pipe through the kitchen floor into the flue, or through a window, the sash being taken out and the space about the pipe closed by a bank of earth. By running the pipe up a few feet on the outside, and wiring it to a stake, sufficient draft will be got; but a close watch must be kept on sparks, and no fire should be kept in the stove during the night. Two or more lighted kerosene lamps in a cellar will often prevent freezing.

A Corn Festival.

MRS. BUSYHAND, ILLINOIS.

A unique and enjoyable entertainment—"a Corn Festival"—recently given by the young ladies of our village for the benefit of their library fund, proved so satisfactory to all concerned that a description of it may be of interest to the Household Family of the AMERICAN AGRICULTURIST. The room in which it was held was decorated with stalks and ears of corn arranged in all varieties of forms and shapes. At each end of the room, on the wall, was a motto. The letters were made of grains of corn glued on pasteboard. For one red grains had been selected, for the other yellow. The *menu* cards were painted on corn husks. Supper was served from six o'clock to eight. On the table was corned-beef, corned-tongue, corned-mutton, corn-bread, corn-dodgers, boiled cracked corn, corn and beans, and corn hasty pudding with milk, corn-starch cakes and puddings in nameless varieties. At a small table, pop-corn was sold in bunches of a dozen or half dozen ears, or shelled, in paper bags holding either a pint or quart; also popped, buttered, or made into balls. At a large table you could buy a five or ten pound bag of fresh ground corn-meal. Pounded corn and breakfast hominy were also offered for sale. Husk-mats, round and oval, smooth and rough, found ready sale. Small fancy articles were displayed and sold rapidly, drawing forth many favorable comments, not only for the ingenuity that devised them, but also for their beauty. Among these articles were thermometers made of ears of corn gilded or bronzed. Two rows of kernels had been removed and the glass inserted. Key-racks and bangle-boards were made in much the same way. As even an ear as possible was selected, gilded, the small hooks inserted and a ribbon fastened at each end to hang it up by. Table mats, in sets of five, were made by braiding the fine inner husks smoothly and then sewing them together. They were oval in form and were intended to be placed under hot dishes. Dainty emery bags were made by removing an acorn from the cup and replacing it with a brown silk bag, filled with emery. These bags were glued into the cups. There were pretty fancy baskets made of corn husks folded and sewed to pasteboard forms, others of the soft fine husks braided and sewed into graceful shapes. They were lined with bright colored silk and trimmed with ribbon to correspond. During the evening several corn and husking songs were sung, some of which were given in costume.

A Four-Footed Accomplice.

CYRUS TUDOR.

From Clayville to Booneton is about fifteen miles across a rolling prairie, the road running nearly due east and west. Half way between the two towns the traveler comes to a point where a heavy growth of pine trees sweeps away to the northward into a dark, dense forest.

In the spring of 18— a man left Clayville in the morning bound for Booneton. He had registered at the inn as Richard Bixbee, of New York, and he was supposed to have a large sum of money with him. He left Clayville upon horseback in fine health and good spirits, but he was never seen again in Booneton. Perhaps he had, unnoticed, gone part of the way and then returned. At all events he was never heard of more.

About a month later a man from St. Louis left Booneton for Clayville. He was also on horseback and started off well and hearty, but he never reported himself at the place of his destination. Within a fortnight, after this second disappearance two more travelers were missed. What did it mean? The road between the two towns was direct, and there was not even a by-way to lead any one astray, so that to wander from the true track was impossible. During the month of July three more travelers were missed, and the people turned out in a body to search for them. Of course attention was directed to the wood, and the search was extended for miles, but without success.

On the 19th of August a detective whom I will call Smith arrived at Clayville and put up at the inn. He was on the track of the rogues who had robbed the bank in Jackson. He had not been at the inn an hour before he was convinced that the men he sought had passed that way only three days before. When he heard the stories about the travelers who had so mysteriously disappeared from the road that lay before him, he determined to keep his eyes open and see what he could discover.

After he had gone five or six miles the next morning he noticed that his horse began to falter, and in a little while came to a walk and seemed in great pain. Thinking that the creature would soon fall, he slipped from the saddle and led him out on the grass at the side of the road.

As he was thus standing wondering what he should do he observed a man coming toward him from the direction of Booneton. He was mounted on a powerful black horse, without a saddle, and his only bridle was a bit of rope around the animal's nose. He was a simple looking fellow, poorly dressed, and behind him were what appeared to be some empty bags. As he came nearer, Mr. Smith saw him gather up his halter as though he meant to put his horse into a run. So he cried out, "Hello! Stop a moment."

The fellow seemed to consider, but finally turned his horse's head toward Mr. Smith and dismounted. "I've heerd a good deal 'bout this road," he said, eying the detective from top to toe, "and I like to be a little keerful. Met with a fall, stranger?"

"Not exactly a fall. My horse seems to have given out."

The fellow walked around the quivering beast and when he came back he put his hand upon the animal's throat and gave a sharp punch. The horse started back with a grunt, and directly began to slaver at the mouth.

"You don't belong to these parts, stranger?" eying Mr. Smith again.

"No."

"I thought not;" he added. "I guess your hoss has been eatin' Devil's Tail."

"What may that be?"

"It 's a kind o' p'ison," he answered, "that hosses pick up hereabouts. He'll be well enough by tomorrow or next day at the farthest."

"If that 's the case, perhaps you 'll let me trade for yours."

"I never owned anything yet that I wouldn't sell if a man wanted it more 'n I did," he replied.

"Well," said Mr. Smith, "may I ask what your price is?"

"Jest $70." Mr. Smith expected to hear him say a hundred at least, but he took the offer in a moment. The bargain was made, Mr. Smith counted out seven ten dollar pieces, put his bridle and saddle upon the new horse and then mounted.

"Perhaps," said the fellow as he gave the sick horse a punch in the gullet, "if I should see you in Booneton one o' these days you might like to change back again."

Mr. Smith said he would see about that, and bidding him good morning started off.

He had certainly got a good horse. He stepped as lightly and gracefully as a dancing master, and bore him as easily as though he had been in a carriage. In a little while he touched him with a whip and he pranced gayly. He patted him on the neck and told him he liked him. The horse galloped on until they were at the point where the angle of the wood reached the edge of the road, when without apparent cause he suddenly started into a gallop. Mr. Smith spoke to him and tried to hold him, but he only went the faster. In a few minutes he wheeled out of the road and struck into the wood, and now he ran for dear life. The rider yelled with all his might and tugged at the rein till his arms ached, but he could not stop him nor slacken his speed. On he flew like the wind, selecting his course where the trees were farthest apart and sweeping now to the right and now to the left just as the passage through the forest seemed most favorable.

"MAY I ASK WHAT YOUR PRICE IS?"

As soon as he found that the horse was not to be stopped, Smith turned his attention in another direction. Suddenly the thought flashed into his mind that the horse *had been trained*. Like Arabian horses he had read of, the animal would probably make for his master's habitation. The man with whom he had traded was one of a gang, and there must have been another at the stable of the inn at Clayville who had poisoned the horse he started with. These thoughts only flashed through his mind with lightning-like rapidity, but they were systematically arranged as they came, and he knew he had been trapped, and that the animal was bearing him to the haunt of the robbers. For a moment he had a desire to keep on and meet the rascals, but that would only be madness. He must get off the saddle somehow.

Ahead he saw a stream of water. He withdrew his feet from the stirrups and placed his hand on the pommel of the saddle. One more leap and the horse's feet touched the pebbly shore. With a sudden spring he lifted himself clear of the saddle, and as the beast flew from under him he dropped into the brook unhurt. As quickly as possible he scrambled up the bank, and when he reached the wood stopped to consider. The horse had waited on the opposite side as if looking for his rider, but soon turned and galloped away.

What should he do? Of course he must get out of the wood, and to do that safely he must go back by the way he came. He looked to his pistols and started. The sun gave him his direction. By and by he heard the tread of a horse ahead, and as quickly as possible found shelter behind a huge pine tree. The horse came along within a hundred yards of him. The rider was the honest looking fellow who feared Mr. Smith to be a robber, and the horse was the one on which he had started from Clayville. The animal still foamed at the mouth, but cantered along without apparent trouble. So the "poison" had not been so very deadly; moreover, the punching in the gullet had not been without its effect. Surely the plan had been a shrewd one, and the game had been adroitly played, only the victim had chanced to gain one effective play before it could be finished. He remained behind the tree until the horseman had disappeared, and then moved on again.

He hurried forward with all possible speed, and in a little while after he reached the highway he had the good fortune to be overtaken by a man in a wagon. When first hailed he drew a pistol, and seemed disinclined to stop, but in a moment more he recognized Mr. Smith as a man whom he had seen on the road beyond Clayville and finally took him in. He was bound for Booneton and was glad to have found safe company. The detective did not tell him what he had discovered, but explained the fact of his being afoot by mentioning his horse's failure by the wayside.

Arrived at Booneton, he found two shrewd looking officers to whom he communicated his secret, and together they laid a plan for discovering the robbers. On the following day they proceeded to that point of the road where the trained horse had turned off into the wood, but found nothing. The next day they went again and this time they had the good fortune to meet the honest, good looking horse trader astride of the very animal that had carried Mr. Smith to the brook. He did not recognize Mr. Smith and readily stopped when they hailed him, and as may be supposed they captured him without trouble. At first he expressed much surprise, but when he came to recognize Mr. Smith he expressed his willingness to go with them where they pleased. They carried him to Booneton, and while the officers were taking him to the tavern Mr. Smith took good care of the horse.

The fellow gave his name as Mark Sackett, and swore that he knew nothing of any of the robbers, while touching the affair of the horse he was also wholly ignorant. He said he saw Mr. Smith as he was carried into the wood, and as the horse he had left with him began to revive he mounted and followed.

But the astute detective had an idea of his own. He thought if there was a haunt of robbers, the prisoner's horse would take them there, and when he gave his opinion to the officers, they jumped at the same conclusion. It was only an hour past noon and in sixty minutes more there were twenty mounted men ready to follow Mr. Smith.

The black horse was led out, bridled and saddled and Mr. Smith took his seat in the saddle. The steed behaved well and seemed to like the company of other horses and to be proud to lead them. When they reached the wood his rider gave him the rein and he turned off just where he had turned and dashed on before, until he came to the brook where Mr. Smith had made his leap, and then away through the dark, deep, wood beyond.

By and by they came to another stream. Upon the opposite side was a perpendicular bluff, and it appeared to them that there could be no passage that way. But the black horse pushed into the stream, and when he reached the farther shore walked down a few rods into the shallow water,

and then turning to the right entered a narrow pass which had been before invisible. A little way through this curious passage, they came into a deep cavern, walled in on all sides by a perpendicular bank, and here they found six men. They started up in affright when they saw the officers, but as the posse's pistols were quickly out they did not offer resistance. One made a dash toward a point in the wall directly behind Mr. Smith's companion, but he was quickly stopped and as Mr. Smith's eyes followed the course he had taken he discovered an open space in the face of the bluff.

I need not relate how they overcame the villains, nor need I transcribe the thousand and one wicked words that were said; suffice it to say that they secured all the miscreants and then examined the opening in the bank. It proved to be what Mr. Smith suspected, and they found concealed plenty of arms and ammunition, as well as many valuables which had been taken from murdered travelers. The whole thing had happened very fortunately for the guardians of the law, for had the robbers been in possession of their firearms, it would have been hot work for them, for they were desperate characters, but they fairly caught them napping. And one thing more—Mr. Smith discovered among the party the two bank robbers of whom he was in search.

The officers and the six villains returned to Booneton, and after the rascals had been lodged in jail, the one whom they had captured on the road, and with whom Mr. Smith had made the trade, turned state's evidence, and his story was just what they expected. He said the gang had been together for several years, operating in several parts of the country. The horse had been trained by one of the company (who had been an old circus performer) when sent off without any breakfast, to dash off with the victim as he had done with Mr. Smith. But the victim was not always carried to the cavernous retreat. When a prize was expected some of the gang stationed themselves along the wood between the two streams, ready to stop the horse and dispatch the traveller. Mr. Smith was assured that if he had been taken across the creek he would have met his death very quickly afterward. When a traveller was "spotted," one of their members was sent to look out for said traveler's horse and by some trouble administered a sickening dose to the horse.

The rascals were tried, condemned and executed and Mr. Smith retained possession of the trained horse but he did not keep him long. One bright morning he missed him from the stable, and all search was in vain. It is possible that the intelligent animal unfastened his halter strap and ran away, but I have chosen to give the matter a different solution. I believe he was stolen by the honest looking countryman in whose hands Mr. Smith first found him, and who was let loose on account of turning state's evidence.

Jack's Adventure With a Lynx.

SYDNEY DAYRE.

"Who'll tell us a good winter story?" asked Rob, as the family, all at home for the holidays, gathered about the glowing grate on a stormy winter evening; "a regular rouser of a yarn, all about fighting blizzards and such?"

"Indeed," said his sister, "I'd rather have something summery—a story that will make us forget for a few moments the snow and the wind and the frost."

"I might do that," said Jack, the oldest son, a young collegian who had spent his summer vacation in the Canadian woods. He had not been home since then until now, and had many stories to tell of his adventures.

"Yes," said his mother, "tell us more about your camp life."

DISCOVERING THE ROBBERS' CAVE.

"Tell us about that wild cat adventure you spoke of in one of your letters," said Rob. "You seemed to think you were in real danger that time."

"Say lynx, if you please, Rob," said Jack. "Lynx sounds a great deal more dignified than wild cat. I'm sure I said lynx in my letter."

"O yes, I believe you did, but you college fellows always call things by their biggest name. *I* call it a wild cat."

"Call it wild cat if your peace of mind is concerned in it," said his brother. "But whatever it may be called, I don't believe I want another of the things to get after me when I'm alone."

"O, then it was the lynx hunting you, instead of you hunting the lynx, hey?" asked Rob.

"A little of both, I should say," said Jack. "I was paddling my canoe up one of those small streams which in Canada so often run off into swamps and seem to get lost there. We were a jolly party of boys tenting in those great woods where, you know, there is not a human being for many and many a mile away. And we had an experienced old hunter, a regular woodsman among us.

"We had all been trying for deer, and one evening I was sure I was on the track of one. I kept paddling away as noiselessly as I could, determined not to give up so long as I had any hope of securing my prize. Sometimes I could catch a faint glimpse of his white antlers far away under the trees as he browsed on some of the small bushes.

"After a while I began to see, so far as I could take time to see anything, that I was losing my stream and getting deeper and deeper into the swamp. As twilight settled down, the shadows of the woods became so deep that I had little further chance of looking out for my deer. At last I entirely lost sight of him and was vexed enough at being obliged to make up my mind that he had escaped me. It would have covered me with glory could I have taken him, for not one of us had had so much as a single shot at one. And now I began to think of getting back to the camp, but how was I to do it? I had been turning and turning about wherever I could find water enough to float my canoe, until I had little idea how far I had come or in what direction the camp lay."

"Very imprudent," said Mother, with a gentle shake of her head.

Jack looked at her with a loving smile, thinking how fortunate it is for their own peace of mind that mothers have so little idea of the imprudent things sometimes done by their boys.

"Yes," he assented, "I began to realize that when I took up my gun to fire that I might get an answering shot from camp, as we had agreed upon, to let me know how to find my way there. But just as I was on the point of firing I thought of looking to see how my ammunition was holding out. I didn't want to be in those woods all alone, without any. And, in fact, I found plenty of shot, but not a full charge of powder in my flask.

"So I didn't dare to fire. I gave two or three shouts, hoping my voice might reach the fellows; and just then I heard a growl right square above my head. I looked up and saw a pair of the brightest, wickedest eyes I ever looked at in my life, glaring down upon me."

"I know what a cat's eyes are in the dark," said Rob, gravely.

"I didn't know what it was, but I had heard the hunters tell about wild cats—I didn't care much then, Rob, whether you called it lynx or not—so that I guessed it might be that kind of a thing. For a moment I thought he was going to spring down on my canoe, and I knew that if he did there was little hope for me, for they do say that of all ugly things to take you at a disadvantage they are about the ugliest. What could I do in my canoe without a chance of a shot at him—even if he

didn't turn me over into the water, which was most likely? Those little Canada canoes are frisky things to manage.

"Well, he didn't bounce down on me at once, and as soon as I had time to rally my wits I gave a quick movement with my paddle and managed to reach the shore. There was a stump there and I set my back against it just as with a snarl and a growl he gave a leap and came to the ground not fifteen feet from me.

"I couldn't see anything but a dark mass, not very large, and those dreadful eyes. I thought the brute was going to spring at me and I fixed my eyes on the flashing ones to try the old plan of intimidation that we read of."

"Didn't you have your gun?" asked Rob.

"Yes, a hunter never loses hold of his gun, you know."

"Then why didn't you shoot him at once?"

"I didn't want to risk it. If I missed him I hadn't another resource. I thought that if he'd let me alone I'd be glad to let him alone.

"I knew he could see far better in the darkness than I could, and I kept my eyes fixed upon him. It really seemed to have an effect, for he crouched down and crept off to one side as if trying to get round behind me. I turned, too, never taking my eyes off him. On he kept, making a complete round about the stump and I turned with him.

"Well, he kept that up for hours, at just about the same distance from me. In making his round he would sometimes be entirely hidden by the shadows and then come out again so that I could see the dim outline of his form; but in or out of the shadow all the time those terrible eyes kept up their glare. My own eyes ached and burned with the strain. I tried to calculate how the time might be going. I knew it must have been about eight o'clock when the cat had first come at me, for up there in the North the summer twilights are long. I determined to wait for the moon to rise and then fire at any risk, for it seemed as though all my strength was going.

"At last a yellow light began to steal over everything and the moon came up—a little beyond the full, but so bright as to make things almost like day. Then I could see the grayish brown of the fur of my foe as he still crept round and round me.

"I gathered all my nerve and fired. With a terrible snarling growl, which sounded like the exaggerated me-o-o-o-o-w of a dozen home cats, he tore the ground with his cruel claws—how thankful I was they were not trying themselves on me! I kept out of the way of his struggles for a few moments until, seeing that my shot had done good work, I ventured near enough to give him a rap on the head with my gun, and that was the last of him.

"The next thing I heard was the crack of another gun, and then some shouts and hurrahs which sounded rather musically to me, you may be sure. I shouted back, and before long the old hunter and one or two of the boys came up.

"'My stars!' exclaimed old Barrows, hauling out the creature into the full moonlight. 'If that isn't as big a one as I ever see in my life. I was gettin' scared about you, boy, but I'd a' been scareder yet if I'd knowed.'

"That's all. I'll show you the skin, though. It's upstairs in the bottom of my camp chest."

He brought it down and showed it in great pride.

"What claws!" exclaimed Mother, with a throb of thanksgiving in her heart.

"I'm glad they didn't get at your face," said Rob, quite impressed. "And I'll always say lynx after this, Jack. And if there was a bigger name for it, I'd say that."

What the "Cat Tails" Taught.

O. M. CROSBY, NEW YORK.

Is it snowing? Looking out of the window in my elevated down-town office I note feathery, flake-like atoms floating about in the chill air, while the dull clouds overhead almost convince me that the first snow storm has really come and our long winter begun. I capture one of the restless "flakes." It does not melt in my hand, but shows a disposition to fly off, as though animated, very like thistle down, but smaller, and the air seems full of them. Has any feather factory clerk been "dusting" out of the windows? Certainly not; at least these travelers came from no such source. A railroad ride over the miles of Jersey meadows solves the mystery. "Cat tails" are ripe and the western wind has detached the feathery balloons, wafted them over the great city where they wander to and fro, looking for soil to deposit the tiny seed within and, over the paved streets, finding it not.

Who can count the seeds on a "cat tail" head or count the "heads" on an acre to multiply by the thousands of acres of Jersey meadows which grow them? How prodigal is Nature of her seeds! How many more than enough are there for all human needs! The ratio is not so great in cultivated herbs, or grains, and it rapidly narrows as perfection is attained. The Canada thistle seeds in a Northern wheat field often far outnumber the grains of wheat. All this would seem in direct contradiction of the law of "the survival of the fittest."

These are pessimistic ideas in their tendency, but there is a brighter side. Florists are constantly elevating the standards among flowers. The matchless pansy, four inches in diameter, of marvelous beauty, has evolved from the wood violet under high culture. While the violet has grown no less attractive, the pansy has greatly improved. Note the choice varieties of apples propagated from miserable seedlings, the Perfection tomato which started from the wild "love apple" and two blades of grass of better quality "where but one grew." Apply this to mankind, and may we not believe that while the masses are not growing worse, very many are growing purer, nobler and better, moving on until the great day when "all shall know Him, from the least to the greatest?"

The American Chameleon.

JOHN M. MURPHY, FLORIDA.

One of the most interesting little creatures in the Southern States is the pigmy lizard (*Anolis principalis*). I have called it the American chameleon because it possesses the power to change its hue, but it bears little resemblance to its namesakes in Asia and Africa. Its transformation of color is due to a desire to procure food and protect itself from its enemies by assuming the hue of its immediate surroundings. If placed on a piece of white paper it becomes in a few moments almost snowy in appearance; transferred to a bush it quickly changes to a light green; and if put on the ground it assumes the color of the soil with almost magical rapidity. Its ordinary hue, while running on my grove, is a brownish black, and I have seen it maintain that color for some time after running up a tree, or until it wished to display the "transformation scene." Anger or tranquillity, sunshine or shadow, hunger or plenty affect its color, which soon changes with the state of its feelings. I have seen two of these lizards play together in the most animated manner for several minutes, until the stronger held the weaker down on the ground and refused to allow it to move. This seemed to rouse all the fury stored in the body of the latter, for it tried to bite the other, and being unable to do so changed gradually from a brown to a light green color. The alteration produced an immediate effect on the bully, for it scampered away to a lemon tree in such haste as to lead me to think it had forgotten something there and was in a hurry to get it, while its companion sought refuge on a weigelia and expressed its feelings by alternately inflating and depressing its flexible throat. I have seen others undergo the same change while cowering under the weight of a cat's paw, yet I have never seen puss injure one, although she would probably eat one willingly, if hungry.

Few persons, in watching the alert, graceful movements and intelligent actions of this beautiful little creature would ever think it a relative of such voracious monsters as the alligator and crocodile, yet it belongs to the same family, and is one of the connecting links between the huge saurians and the ophidians, or snakes. It is simply a pigmy alligator adapted to living on land, and somewhat modified in form and character by its mode of life. Among its kindred are gavials, crocodiles, skinks, iguanas and geckoes. All are carnivorous, the larger feeding on whatever they can capture, and the smaller on flies and other insects. One of the nearest relatives of the American chameleon in the United States is the Gila Monster of Arizona, yet no two allied creatures can be more dissimilar in habits and character. The former is all activity, gracefulness and gentleness, whereas the latter is sluggish, ill-natured and moody, and secretes a poison so venomous that the bite of the animal is considered exceedingly dangerous to man and the larger quadrupeds. The monster is a foot long, from nose to tip of tail, and the chameleon half that.

All lizards present the phenomenon, extraordinary among land animals at least, of being able to renew their tails after they have been cut off, while the caudal appendage retains life for a considerable time after being severed from the body. The lobster enjoys much the same power among marine fauna, it being able to replace its claws almost as fast as it loses them. The tail of the lizard, being brittle and easily broken, gave rise to the marvelous stories in circulation among old farmers concerning the glass snake which would fall to pieces when struck, and subsequently reunite, no matter how far apart they might be. We know that an earth worm, if simply cut in two, will develop a perfect animal from each part, but no person would be bold enough to assert that if it were chopped into small particles, and scattered broadcast, there would reunite into a complete whole.

The chameleon's tail averages about three inches in length and tapers to a thread-like point. The head is flat and somewhat pyriform; the eyes are brilliant; the teeth fine, sharp and numerous; and the body is quite slender. It has four legs, and the hind pair are specially fitted for enabling it to run rapidly and leap a long distance, being elongated and widely set. The feet are quite large in proportion to the body, and the toes broad-spreading. These characteristics enable it to jump very high for a creature of its size, and to get over ground with a celerity which fully entitles it to the name of swift. I have seen it bound two feet into the air after an alluring insect, and outpace a cat in a run of fifty or sixty feet.

It is an excellent insect-catcher, and does as much work in its favorite pursuit among trees as a toad does on the ground. It wanders over a tree for hours at a time, closely scanning the foliage for its prey and promptly gobbling down all it meets. I have often been amused at the dainty way in which it holds a tempting insect in its mouth, as if reveling in anticipation over a delicious morsel. It may carry the fly in its teeth for several minutes before eating it, much as a cat does a mouse; then gulp it down suddenly. I consider it far more useful in a grove or garden than any species of bird; hence, I never allow one to be injured, if I am in time to prevent it. Some of the negroes think it poisonous, and kill it at sight, but they do not repeat the offense on my grove, so far as I can learn. I try to protect it in every way in my power, and it rewards me by destroying thousands of insects injurious to my trees. If I find one that has been disturbed in its hibernation during the winter, I replace it in its snug little bedroom and guard it from future annoyance by covering its retreat with brush and leaves. Like every other creature, this has its faults. If it gets into an apiary it will soon reduce the number of its inhabitants; yet it is not so destructive in this respect as the toad, for the reason that it cannot eat as much, and is not so quick in snapping up the *Aphides*. Bee-hives should therefore be protected from its visits.

The most ruthless enemy of the chameleon is the shrike, or butcher bird, generally known as the loggerhead mocking-bird among the natives of Florida. This pounces upon it, and, carrying it to a lemon or orange tree, fastens it by the neck to a large thorn, where it is left until needed for food. The bird usually pins it through the back of the neck, and in such a conspicuous position that it can be readily seen. The shrike kills more than it needs; I have frequently found lizards which it had impaled on bushes, untouched and in the last stage of decomposition.

The chameleon is quite fearless, and is therefore easily tamed by kindness. If allowed the run of a house, it soon becomes so familiar with the inmates as to take insects from their fingers, and, even to look pertly in their faces, with an inquiring glance which may be interpreted, "Haven't you any flies for me?" It cocks its brownish little eyes in the most knowing manner, first on one side, then on the other, and, after satisfying its curiosity, scuttles away to some favorite retreat. It is a pet in many households, and some ladies become so much attached to it as to keep several chained to their persons by silken bands fastened to their own head gear and the chameleon's neck. This may be carrying attachment a little too far; still it is doubtful if such women could find a more harmless, clean, graceful and innocent creature on which to lavish their affection than this diminutive reptile. Some may object to this sort of a pet, yet it is preferable to a lazy, worthless pug, whose sole aim in life seems to be to look as wrinkle-

visaged and ugly as possible, and to typify slothfulness in the canine world.

The *Anolis* assumes an angry aspect occasionally, and puffs out its little throat to the fullest extent, but this is all mere demonstration, for it never attempts to injure anything more formidable than a lively fly or a fat caterpillar. Those who are not acquainted with its character may think these windy threats mean a daring attack, but the lifting of a finger will dispel that delusion by routing the little pretender and sending it scurrying away. This trick is one which it inherits from remote ancestors, who found it useful in protecting themselves from fierce but cautious assailants which looked upon size as an indication of strength and ferocity. Alligators of the present day make the same display when encountered on land, and exhale a strong musky perfume, as if they depended on their ferocious aspect and pungent odor to frighten away all enemies.

As the *Anolis* is found in all the lower portions of the Cotton States, and is very prolific, its chances of a prolonged existence are excellent, and it will probably be a familiar figure in grove and garden long after its congener, the alligator, has disappeared from the face of the earth.

The Doctor's Talks.

The great family of plants, the *Compositæ*, presents so many different forms, that I fear I have talked too much about them. Not that I have exhausted the subject, but having given so much space to these, I shall have to pass by many things about other plants that I would gladly notice. One way the great variety of plants is produced is by the union of parts of the flower, or it may be of leaves of other parts. The flower of that vile and poisonous weed the *Stramonium* or "Devil's apple" and "thorn apple," is a very interesting one, as shown in Fig. 1. In this you will see that the parts of the *calyx*, the *sepals*, are grown together by their adjoining edges, and the *corolla* is also all in one piece, a funnel-shaped body. The open end of this funnel terminates in five lobes, as if the union of the five petals was not complete. Compare this with the flower of the common Morning-glory, in which the sepals are separate, while the petals are more completely united, leaving no lobes, as in the *Stramonium*; the through lines, running lengthwise of the corolla, plainly suggest the union of parts. This union of parts to a greater or less degree is shown in Figs. 2, 3, 4 and 5, which are from Dr. Gray's "First Lessons in Botany," the best work in existence for beginners. If any one of my young readers can afford it, he or she should get this work, and see how the most learned of botanists could make the most difficult points clear to children. In his death, which took place last January, children—indeed all lovers of plants—lost their best teacher. Fig. 2 is the flower of a common roadside weed which forms large patches and produces numerous clusters of pale rose single or double flowers. It is known as "Soapwort," and "Bouncing Bet." As its botanical name is *Saponaria*, from the Latin name for soap, you will wonder why. The green herb, if bruised, and rubbed in water, forms a lather and serves to cleanse clothing in the same manner as soap. There are a number of vegetables that possess this principle, which is called *saponine*. The bark of a South American tree is sold in the drug stores to use as soap. You will observe that this flower, the *Saponaria*, has five distinct petals. Each of these petals has a narrow straight stem, the *claw*, and a spreading wide portion, the *limb* or *blade*, the claw corresponding to the petiole of a leaf, and the upper portion to the blade. Pinks and others of that family have similar petals. Flowers of this kind with the petals are more or less united. A showy garden plant, a *Gilia*, popularly called "Standing Cypress," has the claws of the petals united to form a tube, and the blades but partly formed, as in Fig 3. The "Cypress Vine," *Ipomœa quamoclit*, Fig. 4, has the union of petals carried still farther.

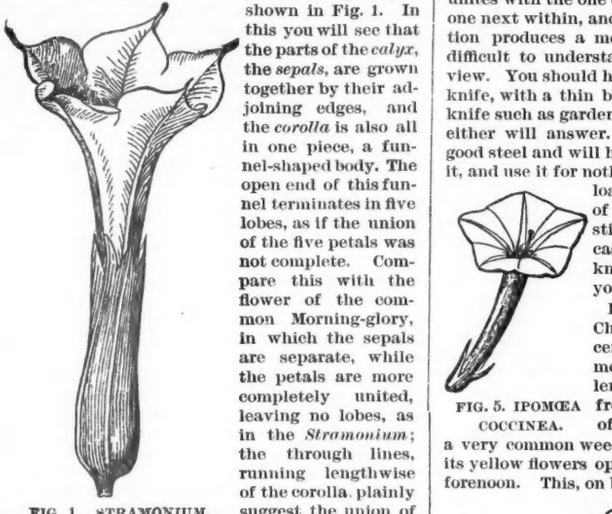


FIG. 1. STRAMONIUM.

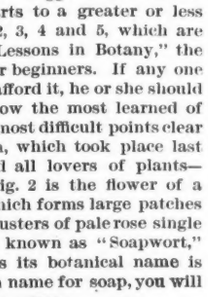


FIG. 2. SAPONARIA.

FIG. 3. GILIA.

A little "Scarlet Morning Glory," common in gardens, has flowers, as in Fig. 5, in which the union of petals is very complete. You will find great pleasure in studying plants, to be able to apply what you have learned to other plants—those you have not noticed before. Here in this talk, we have no forms explained by the union of parts of the same series, or kind; thus the union of sepals to sepal, etc.

I have noticed only the union of sepals with each other, and the petals. I should mention that flowers with the petals all distinct are called *polypetalous* (many petals). Those with the petals more or less united are often called *monopetalous*, but it is better to say *gamopetalous*, as that means petals grown together. You will meet with other flowers which the union of petals to one another will not explain; another kind of union of parts takes place; not only do sepals and petals unite, but parts of different series unite; for instance, the calyx may unite with the corolla. The stamens often adhere to the corolla and each series unites with the one exterior and the one next within, and this consolidation produces a monstrous flower, difficult to understand but for this view. You should have a very sharp knife, with a thin blade; a budding knife such as gardeners use, or a surgeon's scalpel; either will answer. These are usually made of good steel and will hold an edge; learn to sharpen it, and use it for nothing else, which means do not loan it. A cheap razor is often of good stuff; if provided with a stiff wooden handle and a leather case it will make an excellent knife. Practice can only teach you to cut nicely.

FIG. 4. CYPRESS VINE.

FIG. 5. IPOMŒA COCCINEA.

Fig. 6 shows the flower of a Cherry, cut down through the center. Calyx, corolla and stamens are all united part of their length, while the pistil is left free. In Fig. 7 the flower is that of the Purslane or "Pursley," a very common weed, and only to be found with its yellow flowers open in bright sunshine in the forenoon. This, on being divided lengthwise, will show that the union of parts extends to the pistil. In the Thorn, Fig. 8, also the Apple, Pear, etc., the union of parts is so complete that they can hardly be distinguished. In these fruits the calyx tube greatly enlarges and becomes the edible portion.

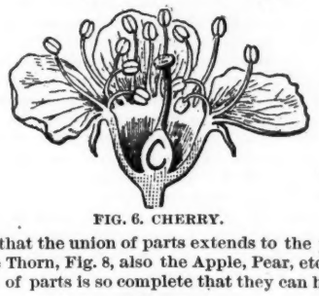


FIG. 6. CHERRY.

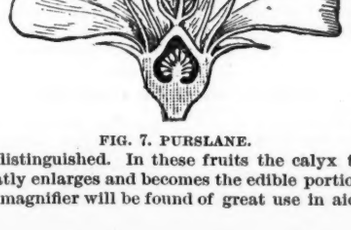


FIG. 7. PURSLANE.

A magnifier will be found of great use in aiding you to see the points more distinctly. This need not be a very powerful or very costly one. A glass about like that in the AMERICAN AGRICULTURIST simple microscope will answer, but unlike that the glass should have covers to protect it from being scratched while it is carried in the pocket.

FIG. 8. HAWTHORN.

This microscope glass may be used if provided with a bag of chamois skin. I almost envy every youngster who for the first time enters the wonderful garden that is spread before him, and sees objects of great, almost bewildering, variety, yet all formed on one general plan. THE DOCTOR.

Map Puzzle.

All the words printed below in *italic* are to be replaced by names found on the map of the United States. These changes will make a complete narrative.

Some boys and girls met together one *city in Ohio* afternoon, at a *lake in Dakota* under a *creek in Montana*, to go for a walk in a *lake in Canada*. The first to arrive was a *city in Arkansas*, *river in Dakota*, and then came *river in Virginia*, *sound in Canada*, with his *mountain in Oregon* named *town in Georgia*, and *city in Alabama*, and little *river in Mississippi;* then came *city in Iowa* who brought his gun and a *river in Montana* full of *river in Montana* for he hoped to shoot something and said that he would like to meet a *rapids in Montana*, a *city in New York*, or even a *mountain-range in Montana*. Next came *cape in Virginia*, and *city in Kansas*, *town in Kentucky*, with their sister *city in Montana*, and her friend *village in Iowa*, the latter wearing a pretty new *mountain in Oregon*. The young people set off gayly and after a delightful walk sat down to rest in the shade of a *river in Dakota*. They had brought a nice lunch of *river in Iowa*, sandwiches and new *river in Montana*, and while they were enjoying this, *town in Georgia* suddenly cried out, "I see a *river in Idaho*—look!"

The other girls screamed, and *cape in Virginia* pulled out his *river in Dakota* which his father had given him at *lake in Oregon*.

Perhaps it is a *lake in Montana*, said *city in Montana*, trembling.

"More likely a *river in Dakota*," retorted *city in Iowa*.

"Sit still, *river in Mississippi* like a *river in Dakota* child," said *river in Virginia*, and when all had finished lunch they strolled on to a little pond and stood looking down through the *river in Idaho* to the *city in Montana*.

"*City in Arizona!*" shouted *city in Kansas* pulling out his hook and line, "let us go *falls in Idaho*."

"O, yes," said *river in Mississippi*, "we might catch a *river in Idaho!*"

"You little *city in California*," said *city in Alabama*, and they all laughed merrily.

"I think we ought to go *city in Alabama*," said *city in New York* pointing to the sky where a great cloud shaped like a *mountain in Montana* was floating, and she showed her *river in Montana*, for very soon a sound of *bay in Michigan* was heard. As soon as they reached *town in Pennsylvania* the storm began, but it did not last long and then the young people walked along the *creek in Dakota* road to the top of a *town in Ohio*, to see the *town in Virginia*, and admire the *river in Utah*, *river in Dakota*, and tints of the clouds, and *river of Utah* in the grass.

ANSWERS TO LAST MONTH'S PUZZLES.

Seven animals: Dog, ape, whale, ass, wren, toad, sable. Enigma: Food. Square words: 1, cat, ale, tea; 2, lane, amen, need, ends.

What is now the great and powerful nation of Germany was composed in the eighteenth century of nearly three hundred States, each governed by its own petty sovereign. These disunited States had little influence in European affairs, where united Germany is to-day a dominant force.

FROM NEAR AND FAR.

—o:o—

Our readers in all parts of the world are cordially invited to contribute letters or notes to this department.

Reclaiming Salt Marshes.

On account of the great value of agricultural land in Europe most of the salt marshes on that continent have been reclaimed from the sea. In America land is so easily obtained that the attention of capitalists and agriculturists has been directed away from the sea-shore swamps. There are thousands of acres of excellent agricultural land near our large cities simply awaiting improvements which in many cases can be easily made and at a trifling cost. Areas of vast extent which now furnish but a few tons of poor salt hay may be made to yield valuable crops and support thousands of individuals. Perhaps the largest swamps of this description north of Long Island Sound are the marshes of the Plum Island system, near Newburyport, Mass. These include some 20,000 acres of marine swamp, over one-half of which can be reclaimed by a very simple system of dams. They are well placed for utilization not only from their large area, but the channels which traverse them are, on account of their shallowness, but little used for boat harbors or any other purposes. The fresh water which flows through them is small in amount. The length of the dam required at the southern end will not exceed 3000 yards; the dam of the northern is already made by the embankment of the Plum Island turnpike and requires only flood-gates. The greatest depth of water at high tide on the line of this dike will not exceed twenty feet, and this for only a small part of its length. The average required height of the dam will probably not exceed ten feet. An abundance of clay for the structure could be found at the western end of the proposed dike. Its construction will be by no means a difficult engineering problem. The natural water storage spaces within the area are so large, and the places for exit sluices so numerous that it will be possible to lower the level of the water at least five feet below the surface of the marsh. In case the Plum Island marshes are diked in, there will undoubtedly be some changes in the altitude of the sand bars at the mouth of Ipswich river, but to what extent this will injure the anchorage in the river it is not easy to determine. It certainly will not do sufficient damage to counteract the benefits to be derived from the reclamation. Land that can now be bought for $5 per acre will thus, in a few years, become worth ten times that amount and more—probably twenty times the present value.

RALPH S. TARR, Essex Co., Mass.

The Navel Boom.

The Navel orange comes from Bahia in Brazil. It has been cultivated in Florida, Australia and other places, but appears to have reached its greatest perfection in Riverside and the contiguous orange belt in California. Some prefer the St. Michael to the Mediterranean sweet, and predict for it a great future popularity. It has a delicious sub-acid flavor. The Maltese Blood is a favorite with many growers, but in some quarters there is a prejudice against the bloody streaks and blotches which give the name, and it does not market as freely as the other varieties. These oranges do not put on their full color after early marketing; indeed, the Navel does not acquire its rich deep hue until fully ripe. Sufficient attention is not given here to the seedlings, which may prove to be of prime importance in the future of orange growing. No doubt the main reason is the existence of what may well be called the Navel boom. It has worked like the land boom, in some respects; that is to say, there has been a feverish eagerness to force it, because the fruit can be brought on early, and has realized such prodigious prices. When an orange grower receives seventy-five cents a dozen for fine Navels on the trees, as did one of my neighbors last year, the temptation is great to work the Navel mine to its best. I am told that over ninety per cent of the sales at the nurseries are of this variety, and it is not strange. One prominent orchard near the town is thus stocked: Out of twenty acres, twelve and a half are in Washington Navels, two and a half in seedlings and four and a half in Muscat grapes. There are many growers, however, who are alive on the seedling question, and consider that the future of the orange belt may depend importantly upon this native fruit. In respect to seedlings, as indeed in regard to all points of orange culture as well as the choice of species, this region may be considered as yet in the experimental stage. The divergences of opinion among growers who are considered "authority" are very wide on many points. But there seems little reason to doubt that the future will be a brilliant one.

W. H. W. CAMPBELL, San Bernardino Co., Cal.

The Old North State.

So much attention has been turned to the South recently that it has become fairly well known, but "the South" is a large tract of country and comprises many climates. North Carolina belongs to what might be called the Upper South, where nine months in the year there is no frost, while a delightful temperature prevails in the other three months. Occasional frost clarifies and purifies the air and restores energy to invalids as well as the healthy. Here yellow fever is impossible, and in the upper country there is absolutely no epidemic form of disease. Here are the great pine belts which have been for ages resorted to for their healthful balsamic properties. There are dozens of places where people suffering from pulmonary and throat diseases may find the situations so much valued; excellent hotel accommodations can be had at all the large towns, with good shooting, pleasant drives and fine scenery.

JOHN T. PATRICK, Wake Co., N. C.

An Egyptian Storage Reservoir.

This, the oldest agricultural country in the world, has been for more than three thousand years confronted by the same problem which has recently attracted so much attention in the newest parts of the United States. When the Nile is at full flood a portion of its waters are drawn off in fertilizing streams through irrigating canals, but there is still a constant menace that the flooded river will overflow its banks and devastate the country, as do some of the great American rivers. There is thus an annual alternation between flood and drought. An American engineer, Captain Whitehouse, has proposed to palliate the difficulty and equalize the water supply by means of an immense storage reservoir. The valley called the Wady Raian, some seventy miles from this city, lies lower than the sea level, and it is proposed to excavate a canal between it and the Nile Valley through which the surplus waters may be conducted during the floods and then stored up so that it may be drawn upon when needed for purposes of irrigation. The Wady has an area of over 150,000 acres or 250 square miles at the level of high Nile, and half that area at sea level. The extreme depth below high Nile mark is two hundred and forty-three feet. The estimated cost of the enterprise is $4,135,000, which is a very moderate outlay in view of the immense advantages to be reaped from the results.

J. MONCRIEFF, Cairo, Egypt.

Crops in the Mississippi Valley.

The year just drawing to a close has been with us one of exceptionally low temperature. Excluding a few weeks in July and the early part of August, the summer months were excessively cool. The result is that the main part of the great corn crop is very late and considerably damaged by frost. Harvesting the crop is just beginning at this date (Nov. 2), at least three weeks later than last year. It has also been a poor year for bees to collect honey. There was an abundance of sweet fluids, but the days were too cool for the bees to work early and late. Comb honey sells here at fifteen cents, and extracted honey at ten cents per pound. The immediate valley of the great Mississippi here in North Missouri is becoming noted as a pickle-producing region. This county alone this year produced over 50,000 bushels of pickles, adding thereby $25,000 to the wealth of the county. Two large pickle establishments have been erected at Alexandria this year. The business is very profitable, and is engaged in by nearly every one who owns or can rent a few acres of land.

JASPER BLINES, Clark Co., Mo.

Fruits in Southern California.

Last summer was a wonderful one for fruit. Never was seen such a crop of apricots, nectarines and peaches. The orchard lands were covered with rotting fruit, while the dryers and canneries were taxed to their utmost. One dryer shipped six carloads of dried peaches. The matter of price is not yet determined; it awaits the result of the fruit glut on the market. Next year we shall have a cannery here, and less fruit will be wasted. But there will be less fruit another year anyway, if the broken-down condition of the orchards, from overbearing, signifies anything. Our peach "season" began early in June, and the end is not yet (Sept. 28), and much of the fruit was superb. The grape harvest has now begun, and all available Indians, Chinamen, and the population generally, are busy in the vineyards. The crop is enormous in quantity, and is pronounced very fine in quality. The production so greatly exceeds the estimates that many of our raisin farmers are short of trays. As to prices, one grower recently sold the raisin crop on one hundred and five acres for $10,000, the purchaser to do the entire work of gathering and curing. These figures are not up to some California "boom" prices, but they are good reading. A Riverside sale of dried apricots this summer, by the Messrs. Duncan, came to $2,210 for six acres, or about $3 per tree. This also may be called very fair.

KILRAIN, San Bernardino Co., Cal.

A Land Where Horses are Given Away.

Nobody has thought of this Southern country (Buenos Ayres) as one from which there may spring a rival in wheat growing effort that may affect the market of the United States. As a matter of fact the thing is accomplished, and from the district where I write wheat in grain and in flour is already starting its remunerative journey from the pampas, and has brought back its value from Brazil, Chili, and the Latin states of Europe. Encouraged by these results, the area of planting is increasing. The acreage of the increase, as a fact, is pitiful, and the amount of land under cultivation is to the Yankee mind contemptible; but the possibilities of wheat are greater than those Minnesota knew in 1860, or Dakota and her sister territories enjoy today. A climate that knows no frost, a soil virgin to the plow but enriched by centuries of grasses blown into the land and fertilized by innumerable cattle whose movement over its area has known generations of death as well as the contribution of their life, has made a land fit for the gardener's spade. Its generic character is of course alluvial, but time beyond memory this land east of the Andes has known no curse except that of man, whose misuse of its offerings has brought forth a race whose character, until within ten years, has been that of non-producers, hopeful from the efforts of every enterprise except their own, speculative upon any foreign energy, and ready and anxious to enjoy the fruits of every industry so long as they could profit by either, or hold the harvest reaped where they had not planted, and garnered whence they had not sown.

Buenos Ayres has 120,000 square miles, say seventy-five millions of acres, and the estimated worth of the country is near ten billions of dollars. You may ask, where does the value exist outside of the land and that upon it? I answer, nowhere; and though these lands are not acre by acre trodden by the foot of man, or the horse he rides upon, once a month, they are the sole wealth of a country that has borrowed in Europe in ten years past twice the sum named in my valuation. In debt? Head over heels. How shall they pay the interest is one question which they successfully meet year by year, but how the main body of the debt can be funded is something to be answered as they answer it in the comforting word "manna," (to-morrow).

Let me give some practical illustrations of values here. I went to visit an "estancia" (ranch) of twelve leagues of land (a league is nearly 6,000 acres). I was met at the railway station on a cold winter's morning in July by a four-in-hand. The driver was a peon; the vehicle one under which the two forward wheels turned easily, and its body behind the seats was covered with the home-dressed hides of horses. Its seats were cushioned with padded horsehides, the harnesses were raw horsehide, the whip was braided horsehide, and the pace was a run; no trotting horse is known. Over the pampas, thirty-two miles in 100 minutes, the only skill of the coachmen called upon was to avoid the cattle wallows. It was a pace for experience. Arriving at the estancia the horses were brought up all standing, the harness dragged off and the animals sent adrift on the pampas. I asked the superintendent of the farm what became of those horses. "I don't know," he replied. "What are they worth?" "About three nationals each." (A national is a dollar; in the present depreciated con-

dition of currency, about 57 cents.) That afternoon, with a new four, the superintendent and I were driving and came up with some peons skinning a dead but still steaming horse. An inquiry revealed that it was one of the four that galloped thirty-two miles in the morning. "I knew the driving was too hard," I said; "the horse was killed." "Why, bless your innocent heart," said the superintendent, "we shoot fifty or sixty horses or mares a week. To-morrow I will show you a 'round up.'" And he did; and they killed 74 horses, took their hides, boiled down their fat, stripped the hair from their manes and tails, and counted it profit and left the carcasses on the pampas for the waiting scavenger of South America, the condor. What is it that Carlyle says about the stored-up energy which constitutes a nation's wealth? There was a lot of energy released that day.

It must seem incredible to our Yankee and prairie farmers that horses could be so used, but it is a calm fact that more than 700,000 were slaughtered in the Argentine Republic last year, as shown by the raw hides sold in market. Horses grow wild, and worse horses it is impossible to conceive. A horse is cheaper than a coat—I mean a horse broken to ride or drive. Beggars (and in this country there are many) ride from house to house to solicit alms, and refuse a horse from an almoner from whom they expect a richer gift, for a horse is the cheapest thing he can give.

Judged by our ideas of economy, this all seems mad extravagance. They excuse it in ways not satisfactory to me, for it is extravagance, say what they will. No distance of market can compensate for the waste of pure strength easily realized upon, in a land where a premium of $20 per capita is paid for every immigrant, howsoever poor, who comes to settle and work. Bad as the horses are, one of them is worth any four immigrants I saw of this class out of 10,000 landing in Buenos Ayres in July.

C. IRA, Buenos Ayres, S. A.

Fruit on the Northern Pacific Coast.

A. A. Randall went from Vermont in the fall of 1884, being then sixty-four years old. He bought three acres of land a little over a mile from the business part of the city of Vancouver, Washington Territory. The land was covered with fir stumps. It cost $200 an acre; removing the stumps and roots, and putting it in order for planting, cost $40 an acre. On this lot he has two one-story frame houses and a cistern. There are in the ground about 250 trees, many bearing full crops of fruit—cherry trees of wonderful growth, Alexander and other peaches, pears, plums, prunes and apples. The peach and pear trees, three years old, were loaded down with fruit last summer. From this lot and a five-acre lot of peaches and pears near by he sold 150 baskets of choice peaches, netting him $1 a basket, and selling in Portland at $1.25 a basket. Around the house are some choice flowers, grapevines, with grapes well advanced in size, small fruits and vegetables of all kinds. The raspberries are so prolific that he gathered fifteen bushels. He disposed of his early strawberries, removed the vines and planted the ground in potatoes and corn. None of his ground is idle. His drain supports a dense crop of sunflowers. He thinks he is well off with his eight acres, and is not disposed to glance backward toward the old Vermont home. After the first breaking up of the ground, he has performed all the labor with only one horse. Can you beat this anywhere on soil new and not highly manured?

C. W. SHANE, Clark Co., Washington Ter.

Southwestern Arkansas.

The six counties lying in the extreme southwestern corner of Arkansas have not until within the last few years possessed any railroad facilities. I came here recently from Kansas on a prospecting tour, and in the section mentioned above have seen as fine land and timber as I have ever seen in the North-west. The Red River bottoms are very rich, but besides them there are vast table lands, rolling hills, and along smaller streams, where can be made farms which will produce anything that will grow in the United States. It is a fine fruit country, especially for peaches, pears, apples, grapes and berries of all varieties. Then the mineral resources are inexhaustible. Iron, antimony, lead and gypsum abound. Lignite crops out to the surface in many places. I was told by a man who lives in Hempstead county that several wells had been dug in his neighborhood, and at the depth of from fifteen to twenty feet they found water so strongly impregnated with crude petroleum that they had to be filled up. The country is well adapted to stock raising. Cattle run out all winter and come home in the spring in good order. In some localities I saw buffalo clover growing luxuriantly in the woods. This makes a splendid summer pasture, as it endures the dry weather, and cattle are very fond of it. Hogs run unrestrained, every man having his own mark. They fatten on the mast and are in good killing order by November or December. Of timber, there is an abundant supply of all sorts—pine, oak (white, red, black and post), hickory, ash, walnut, gum and maple. There are a few enterprising lumber men and they are making money. I saw good pine lumber bought at from fifty to seventy-five cents per hundred.

Do not understand me that I have found an Eden without a serpent. There are drawbacks. The roads are bad, there are snakes and mosquitoes, and on the bottom-land chills and fever are prevalent. The people are mixed. In the towns and villages they are as nice, refined, intelligent and hospitable as one will find anywhere. They live well in good, clean, well-furnished houses. I have seen some magnificent flower gardens. But the country dweller, as a rule, has a small house and farm, poor stable, small corn crib and always a dog or two. He will take you in and divide the last meal with you, as a friend, but if you trade with him he is sharp enough to take you in for all you are worth. The average Arkansan ruralist is free and easy, independent, kind, will fight a buzz-saw, if necessary, and take a drink of any thing you have along. These men have a stock of good, hard horse-sense, and the women equal if not excel them. There are plenty of fish in the streams, and quite a supply of game in the forests. There are few prairies, and they are limited in extent. I tried to buy a small black-land farm eighteen miles from the railroad, and the lowest figure was twenty-five dollars per acre cash; but good land farther away can be bought at five dollars to eight dollars per acre.

J. S. MARQUIS, Hempstead Co., Ark.

The Raisin Craze in California.

Our fourth crop of alfalfa has just been harvested (Nov. 1st.) and the fields are now starting up green and luxuriant for the winter pasturage. There has been no frost yet, or rain. The sun shines brightly, and the temperature is delightful. The raisin packers are still busily at work, and long trains, carrying nothing but raisins, are sent out weekly from this San Joaquin valley to Eastern markets. It is estimated that the vineyards of California will have put in market before the close of the present year 1,500,000 boxes of raisins at $2 a box, $3,000,000; 40,000 tons of table grapes at $30 a ton, $1,200,000; 50,000,000 gallons of wine at 20 cents, $10,000,000; 1,500,000 gallons of brandy at $1.40, $2,100,000—aggregating $16,300,000, an income of over $100 per acre for the estimated 150,000 acres of vines now under cultivation. There will be many hundred acres set to raisin grapes about Hanford the coming winter and spring, in addition to the large vineyards put out last spring and those already in bearing. There is nothing more pleasing to the eye than a twenty, or forty, or eighty-acre vineyard, with its straight and seemingly endless rows of verdant growth, from which are peeping the monstrous clusters of ripening Muscats. F. H. Jewett, our leading raisin-packer, tells me it is a poor vineyard that will not yield thirty pounds of Muscats to the vine, and that the yield is oftener forty pounds and frequently fifty. Thus it will be seen that an acre of 400 or more vines will yield from 12,000 to 20,000 pounds to the acre of green fruit. A shrinkage of two-thirds is allowed in drying, making the raisin yield per acre from 4,000 to 6,000 pounds and over per acre.

Every one is after land, and every one, when he gets land, is after raisins. Ministers, bankers and all—no one is exempt from the land and raisin craze. Rev. Mr. Motherall, pastor of the Presbyterian church here, has a raisin vineyard four years from setting, and was offered $120 an acre last August for the grapes upon the vines before being picked,—which he refused. After they were made into raisins he was offered five cents a pound, the estimated crop being 4000 pounds per acre, which offer he also refused. If he packs them, he expects to receive ten cents a pound, which will yield him the very satisfactory sum of $400 per acre. Nothing delighted him more the past season than to take callers through his vineyard, lifting up the vines and pointing out the huge clusters. He thinks some of them were fully as large as the famous "grapes of Eschol." S. E. Biddle, a banker, tells me he refused an offer of $300 an acre for the raisins from his five-year-old vineyard, and expects by packing or selling, direct to the packers, to realize much more. Of course the margin between the prices obtained for grapes on the vines and the packed product is not clear profit. There are the pickers to pay, and trays and boxes to buy, all of which aggregates considerably. Yet every owner of a large vineyard will do well to make his own raisins, and by careful and honest assorting and packing he will soon build up an enviable reputation and a paying market for his individual product.

It is claimed that ten acres of California orchard and vineyard will afford a family of five persons a living, and a neat margin at the end of every year. A gentleman not far from where I live has eleven acres, mainly in apricots, peaches, nectarines and raisin-grapes. Through the winter and early spring he prunes his trees and vines, plows the ground and puts everything in "apple-pie" order; in May he cuts and dries his apricots; in June, July and August the early and late peaches and nectarines; in September he picks his first crop of grapes and dries them into raisins; in October his second crop, and in November finishes packing and marketing the whole, thus pleasantly and profitably rounding out the year with a saving of $1,200 to $1,500 above expenses.

E. H. BARBER, Tulare Co., Cal.

Resources of the New Northwest.

Land in the Indian reservation of Northern Montana, recently thrown open to settlement, can be entered only under the pre-emption act, town-site laws, and the laws governing the disposal of coal lands, desert lands and mineral lands. This limitation excludes entry under the pre-emption and tree-culture laws, which is really a benefit. It will prevent corporations from acquiring large tracts of land by hiring men to live upon it for six months, and at the expiration of that time obtaining a deed. To the actual settler it cuts the number of acres that he might obtain by complying with the law, down to one hundred and sixty instead of three hundred and twenty. Those who were able to break any land after it was thrown open to settlement have raised fine crops of everything, especially root crops and cabbages, which grow to a remarkable size and are of excellent quality. Any kind of vegetable or small grain and small fruit grown in the Eastern States can be raised successfully here. I have a weather record which shows from June 20, 1888, until Sept. 8, a shower every few days, and since the latter date no rain at all. This is the usual weather in this territory—about enough rain while it is actually needed, and during harvest none at all. This gives the farmer plenty of time to gather his crops. One gentleman in this place harvested one thousand two hundred bushels of potatoes from two acres of land, nor is he the only one who did this. They were mostly Early Rose and are very mealy when cooked. Cattle are in a splendid condition. Twenty-two hundred car loads of cattle were shipped by the Manitoba railroad out of Northern Montana up to the end of October, and had the Chicago market remained firm, the amount would have been greatly in excess of this. Several large coal mines are being opened near Fort Belknap, one in particular with a solid vein of seventeen feet. They have run a tunnel in seventy-five feet in the last mentioned. I have met and talked with several Eastern gentlemen who took advantage of the harvest excursions, and all appeared to be well pleased with what they saw.

W. M. WOOLDRIDGE, Choteau Co., Montana.

From the Lone-Star State.

We have here one of the best farming countries in the world, adapted to all kinds of grain and fruit. Apples yield as much and as fine quality here as in the North. Peaches and pears do well in this climate; grapes grow to perfection and make as fine wine as those of California. Wheat is one of our staples, from which the finest flour is made and shipped to all parts of the world. Texas is the champion cotton producing State of the South, and has place for factories of all kinds. Alfalfa, oats and corn produce largely. Such is the Lone-Star State to-day with her large herds of cattle and fine horses, fine farms, her millions of people, and land for millions more.

W. L. MOORE, Denton Co., Texas.

OUR BASKET

The Great Prize Crop Competition inaugurated by the AMERICAN AGRICULTURIST, and fully announced on another page of this number, will create a widespread demand for the means of growing large crops. The best way of complying with this demand will be to present the details showing how phenomenally large crops in different parts of the country have been grown in the past. The readers of the AMERICAN AGRICULTURIST who are acquainted with the circumstances of such large yields, are cordially invited to state them for the benefit of the hundreds, probably thousands, who will compete for the prize of $500 in gold offered by the AMERICAN AGRICULTURIST for the best acre of corn, and also for the similar prize offered for the best acre of wheat, oats and potatoes. Numerous questions may occur to the subscriber on first reading the announcement of this exceedingly liberal prize offer, and if a careful reading does not satisfy you upon any particular point, write and ask the AMERICAN AGRICULTURIST for the precise information you want. Some of the minor details and points about making out the reports will be given in the Book of Instructions and Reports which all can obtain by requesting the same from the publishers of the AMERICAN AGRICULTURIST and inclosing the nominal sum of ten cents.

Divining Rod Wanted.—Jacob Snively, Blair Co., Pa., asks where he can obtain "a mineral ball, rod or compass used in finding gold and silver." For eight hundred years the belief in the efficacy of a divining rod or other occult means for finding deposits of the precious metals or veins of water in the ground, has maintained a hold on the popular mind. That any one should still believe in it is a singular evidence of the vitality of a traditional delusion. The most usual instrument is a slender forked twig of witch-hazel, which is carried by the operator in a certain manner. We can assure our correspondent that the only actual aid to finding gold and silver in the ground is a practical knowledge of geology and mining.

The Best Roofing.—George Baylor, Jefferson Co., W. Va., desires information as to the best and cheapest roofing for cattle houses and sheds. Where good pine shingles can be had at a low price, a shingle roof is generally the best and cheapest. Yet there are many cases where patent roofings are more convenient and durable. Send for circulars of those advertised in the AMERICAN AGRICULTURIST. We have had practical experience with these roofing materials, and know that they are what they are claimed to be.

Destructive Blister Beetles.—C. L. Decker, Johnson Co., Wyoming Ter.: The small, slender, soft, grayish beetle, not more than a half inch long, and with wing covers finely dotted with black, is a species of blister beetle (Cantharis) and is described in entomological works under the name of *Epicauta pardalis*. It is a native of the extreme Western States and Territories and seldom sufficiently abundant to do much harm to cultivated plants. All of the blister beetles, of which there are more than a hundred species native to the United States, are leaf-eating insects, and some of them are so numerous and voracious that they do considerable damage to both field and garden plants. The striped blister beetle (*E. vittata*) is often even more destructive to the potato than the much-talked-of Colorado potato beetle, for when the former does appear in a field it comes in immense numbers, and unless driven away will strip every leaf from the stems in a few hours. If these beetles are disturbed during clear, warm weather, they take to their wings and fly away. Western farmers usually take advantage of this habit of the blister beetles, and when they appear in large numbers the entire family turns out, each armed with a branch of some tree, and sweep the vines until all the beetles are driven from the field. If they settle down upon some neighbor's potato field, he must call out his forces and drive the common enemy further on, perhaps into the woods, or into some field where there are no potatoes for them to feed upon. The worm you sent was so dried up that we are unable to identify it or give you any information in regard to its habits.

Large Profit from a Small Garden.—Those among your readers who have only a small garden plat, and desire to get from it some more tangible return than an occasional dish of "greens," may profit by the experience of a neighbor of mine. His garden was so small that he thought it hardly worth working. So he set half of it, a space thirty feet square, with Downing gooseberries. Last season was their second of bearing (the third from planting) and the proceeds from his one hundred bushes sold for more than thirty dollars.

J. K. REEVES, Warren Co., O.

The Best Family Cow.—M. Parpart, Passaic county, New Jersey, has a small place in the country and intends to keep one cow. He desires to be informed which breed would be the best for him, Holstein or Jersey. The Jerseys are pre-eminently family cows, where butter and cream are wanted in addition to milk. If milk is to be sold a Jersey would not be the most profitable. For home use Jersey skim-milk is nearly as satisfactory for general purposes as whole milk.

The Sewage Farm at Croydon, Eng., contains 525 acres; it has been irrigated with sewage since 1857. A revolving wire wheel, worked by a turbine which obtains the power from the sewage itself, separates the solid from the liquid. The solids (amounting to 10 or 12 cart-loads a week) are removed by a neighboring farmer for fertilizing purposes, and the sewage water is then used for irrigation. In dry weather four millions of gallons in twenty-four hours are thus passed. Before the sewage water is finally discharged into the adjoining river, it passes two or three times over the land. After thirty years of this treatment, the soil does not show the least sign of sewage sickness, and the crops produced are excellent. This year there were two hundred and ten acres in rye grass and pasture, one hundred in mangels, and a lot of wheat and cabbage, the latter crop having sold at $125 per acre. The land does not smell, even in hot weather, any more than all low-lying land. The soil appears to stop the growth of microbes of disease in sewage; not only are the farm employes healthy, but the death rate of the parish in which the sewage is utilized is but half that of the town of Croydon. Nor has the sewage had a damaging effect on the district, as the official valuations have shown a constant increase. Thirty years ago the land which is now the sewage farm was worth 15 to 20 shillings per acre, would maintain only about half an ox per acre, and employed only ten or twelve hands to cultivate it. The same land will now support two and one-half oxen per acre, and makes money by employing one hundred hands at good pay. Two hundred Shorthorn cows are fed on rye grass and brewers' grains in summer, with hay and pulped roots in winter, no cotton-seed meal or cake being used. As soon as the cows fall off in milk they are dried off and sent to the shambles.

Planting Locust Trees.—P. Boal, Tompkins Co., N. Y., wants to know "what we think of the locust tree for planting out," but he does not state for what purpose or in what position. If it is meant for ornament, one tree will probably be sufficient to fill the ground with suckers and seedlings. If the purpose is to raise a forest for timber we would advise planting some other kind of tree, as locust wood is not so much in demand as formerly, while in many localities the locust borer has become so abundant and destructive that it is difficult to obtain a sound and perfect piece of locust timber.

The World's Tobacco Crop.—The tobacco crop of the United States averages about 500,000,000 pounds per year. That of Germany has averaged 90,000,000 pounds for the last fifteen years, enough to affect our export of tobacco to that country to some extent. The export of leaf tobacco is considerably more than half of our crop, and of this more than eighty per cent goes to Europe; and in Europe, Germany, in spite of her large production, takes more than any other country. England comes next, and then Italy, France and Spain in the order of mention.

Beet Sugar.—Two great beet sugar factories were built during last year. One is at Watsonville, Cal., with a capacity of three hundred tons of beets daily, when the beets can be had. The beet sugar product of Europe is about 2,250,000 tons per annum. In the United States the product is less than one thousand tons. The industry will now receive a new impulse under conditions favorable to a broad and generous development.

Truck Farming in Virginia.—Q. W. Avery, Princess Anne Co., writes us: Truck farming is conducted on a large scale in the region around Norfolk, the farms containing from three hundred to ten thousand acres; kale, spinach, potatoes, pease, cabbage, peanuts, and such crops are cultivated in areas of a hundred acres each. Negro labor is generally employed. Kale and spinach were ready for market in the middle of November, yielding about four hundred barrels per acre. Most of the truck raised here goes to New York. Incidentally with truck farming there is much attention given to poultry. Many of my neighbors sell from 250 to 300 turkeys and 1,500 to 3,000 chickens yearly.

American Potato Crop.—The potato crop of the United States for 1888 is placed at 216,000,000 bushels, the largest ever grown, and an increase of 82,000,000 bushels over the crop of 1887, and of 8,000,000 bushels over the large crop of 1883. There will be a decrease in the import of potatoes during the coming months as compared with the import in the early part of 1888, which for last March amounted to 1,645,000 bushels as against 56,700 for March, 1887.

Dakota Wheat.—The wheat crop of Dakota in 1860 was less than 1,000 bushels. In 1880 it was about 3,000,000 bushels. In 1885 it reached 38,000,000 and in 1887, 52,000,000. The crop of 1888 is put at 38,500,000 bushels, a large decline from the year before, but, owing to the increased price of wheat, it will probably yield the Dakota farmers as much money as they received in the previous year, and some authorities think they will receive even more.

Good Words from Alabama.—W. Q. Sewell, Morgan Co., Ala., writes us: Last year I had the AMERICAN AGRICULTURIST addressed to myself and sons. My object was to encourage the boys and induce them to feel a personal interest in the paper. They now strive eagerly to see which one can get it first, as each number arrives. Four of my five sons are in partnership with me on the farm. We are succeding finely with the farm, orchard, vineyard and nursery. We have been greatly benefited by the AMERICAN AGRICULTURIST which I have taken since 1870, and expect to keep right on taking.

Sheep and Wool.—The wool product of the world is estimated at 1,600,000,000 pounds. The sheep number 500,000,000. The sheep and the wool in leading countries are tabulated as follows:

	SHEEP	LBS. WOOL.
Australasia	80,000,000	450,000,000
Argentine Republic	75,000,000	280,000,000
Russia	60,000,000	260,000,000
United States	50,000,000	250,000,000
Great Britain	30,000,000	140,000,000

The wool import of the United States was at latest returns 115,000,000 pounds, of which 18,000,000 were for clothing, and 85,000,000 for carpets. Most of this wool was imported from England. The direct importation from South America was comparatively small except from Uruguay, which, with 16,000,000 sheep, sent us last year 2,585,000 pounds of clothing wool.

The Needs of the South.—Mississippi will have to do more for its agriculture in future. Our tillable lands, which have been under cultivation for years, have been badly handled, and have begun to yield less crops than formerly. Farmers will therefore have to become more skillful in caring for their lands and in cultivating their crops. The trouble with our farmers to-day, not only in Mississippi but all over the United States, is that they are less skilled in their occupation than are those engaged in other vocations. A more thorough system of agricultural education is consequently a pressing necessity in our country. Under a good system in Europe, the lands for the last fifty years have been gradually increasing

their yield per acre, while, under careless husbandry, our per-acre product has gradually diminished all over the country.

GEN. S. D. LEE, Agricultural College, Mississippi.

A Happy New Year.—Our December number overflowed with Christmas cheer. With this issue we send out to half a million readers a cordial New Year's greeting. May 1889 be a year of enjoyment, prosperity and progress to every one. May every good wish be fulfilled, every worthy purpose carried out, every noble aspiration realized. Then it will be indeed a happy new year for all.

Remedy for Cow Pox.—Mr. Louis de la Croix, Rockingham Co., N. H., writes us: "We were troubled with cow pox last fall, the teats of one cow becoming very sore before we learned the nature of the trouble. The whole herd caught it, but as soon as it appeared on any of their udders we washed them with carbolic soap after each milking, applied vaseline to the sore spots, and then blew on powdered sulphur. This treatment proved very effective, and there were only a few cases in which all signs of the disease did not disappear in a day or two."

A New Departure Proposed.—The *Mark Lane Express* and the *Whitehall Review*, two prominent British journals, favor the imposition of a duty of five shillings a quarter on American wheat, in order to restore England's superiority and "vindicate her imperial care for her children." This specific duty is recommended because wheat at forty shillings a quarter means prosperity to English agriculture and at thirty-five shillings, the average of some years past, the wheat lands are sent out of cultivation. It will be a wonderful revolution in English policy if the old "corn laws" should be restored.

A Milking Device.—Rev. N. Scott, Hampshire Co., Mass., writes us that he uses the following device for holding a pail while milking, and finds it very convenient: It consists of a strong string with a hook on each end. The string is just long enough to go around the small of the milker's back and hook to the bail of the milk pail.

That New Leaf.—Now is the time to turn it over. Not only turn it over but gum it down so that it will stay turned. We are talking now to those farmers (there are too many such) who are always growling and croaking and looking on the dark side of things. This is a bright world if you will only open your eyes and see the sunlight. No doubt you have cares and troubles and much to vex and worry you. So has every one. Don't let little matters like these fret you. They are but for a moment; how soon they will pass away and be forgotten! Nothing so transient and trifling should be allowed to disturb one's serenity. We should not expect that everything in this world is to be adjusted to our liking. There will be friction now and then, of course, but the best way always is to keep cool, take things philosophically, and remember that "it won't make any difference a hundred years from now." So quit grumbling. Quit it now and thereby make the new year happier for yourself and for all around you.

The Best Potatoes.—S. Wells, Gloucester Co., N. J., requests us to name the best early and late potato. It would be impossible to designate a variety of potato that would do equally well in all localities. Early Ohio is one of the very best early varieties. Early Rose is still the favorite in our markets, and when well grown in suitable soil it is early and good. Beauty of Hebron is another early and excellent sort. Of the new varieties, "Thorburn" and "Puritan" are highly recommended. Of late varieties we would recommend White Star as one of the best. Empire State and Rural Blush are also highly valued in some sections.

Green Peas in England.—Few of us in this country have any idea of the enormous extent to which green peas are consumed in England, or of the enormous crops that are grown to meet the demand. The climate in general suits them, and the vines do not as with us give out after one or two pickings. A district around Malden, in Essex county, has long been celebrated not only for the quality of the pea crop, but for the quantities grown there. For a month one railway ran three trains a day loaded with green peas only. On August 4th was the highest shipment of the season, when 578 tons were delivered in the market before 7 o'clock in the morning.

The Farmers' Congress.—Among the resolutions adopted by this institution at its meeting in Topeka, Kan., in November, was one recommending that the expenses of the delegates should be paid by the States. This Farmers' Congress is ostensibly made up of one delegate from each Congressional district in every State, appointed by the governor thereof. It certainly is not fair to ask the States to pay the expenses of such a comparatively self-constituted institution. Far more to be admired is the business-like organization of the Patrons of Husbandry, the State organization of which is composed of delegates from the local granges and the National Grange of which is composed of the masters of the State Granges. The Grange, and also the Wheel and the Farmers' Alliance, which are organized on a similar basis, are thus really representative organizations made up of actual working farmers. The Grange and kindred organizations are self-sustaining and herein lies the great secret of their usefulness. To the credit of the Farmers' Congress, however, it may be said that its actions were generally in line with the best interests of farming.

Sale of Manitoba Buffaloes.—Richard Waugh, of Manitoba, writes us as follows concerning the herd of full-blood and half-bred buffaloes which were described in our December issue: "C. J. Jones, of Kansas, has bought the Bedson herd, having organized a joint stock company for buffalo and 'cross' rearing at Garden City, Kan. The herd contains eighty-three animals, as follows: Females, thorough-bred buffalo, thirty-five; males, thorough-bred buffalo, twenty-three; females, grade, three; males, grade, five; calves of 1888, seventeen. They were shipped from Winnipeg on the 18th of November. The only buffaloes now left in Manitoba are on the farm of Sir Donald Smith at Silver Heights near Winnipeg—about half a dozen in all."

Truth About Swine Diseases.—The extensive and elaborate scientific researches undertaken by the Department of Agriculture upon swine diseases have produced many important results, although the confidence of stock owners in the Department's work has been shaken by the violent attacks made upon it by Dr. F. S. Billings, the expert pathologist of the University of Nebraska. The chief of the Bureau of Animal Industry, Dr. D. E. Salmon, has at last taken notice of these attacks and has asked for a board of three disinterested scientists to investigate and decide the points at issue, urging that at least two of these experts should be selected from among those whom Dr. Billings considers qualified to decide such difficult scientific problems. Dr. Salmon places the laboratory and experiment station of his bureau at the disposal of such a board, and every facility for investigation, as he believes his work will stand the closest scrutiny. Commissioner Colman has appointed Prof. T. J. Burrill, of the University of Illinois, Dr. William H. Welsh, of the Johns Hopkins University, and Dr. E. O. Shakspere, of Philadelphia, as such a commission. The scientific standing of these gentlemen is everywhere recognized, and we trust they are so impartial that the results of their investigations will be accepted by the whole country.

High Prices for Draught Horses in England.—Stallions of the large breeds often fetch from $1,500 to $5,000 at public sales in England; mares half these prices, and foals in proportion. At Mr. Pole Zell's late sale of Shire-horses one mare, in her sixteenth year, sold for $785, a foal of hers at foot for $600, and a yearling filly for $2,350. If Pennsylvania's large Dutch mares were choicely selected, and then bred to the finest stallions of the draught breeds, imported from Great Britain and France, the best specimens of their produce, three-fourths to seven-eighths grade, might rival half the above prices. This is a matter worth trying for. The mares may be stinted in autumn to foal the following autumn, and thus they could work on the farm during the whole spring on to late summer without injury. Coming at this season it is as safe to raise the colts as if dropped in the spring, and by spring they can be weaned and turned out to pasture, and no more attention is required for them. At three years of age they will attain about the same size as spring colts six months older.

The Oat Crop.—The production of oats in the United States shows a great increase. In the last eight years the average crop has been 549,000,000 bushels, against an average of 314,000,000 for the ten years preceding. This increase is owing to the requirements of the increased number of horses, to the substitution of oats for corn in the South for feeding horses, and to the more general use of oatmeal as food for man. The area of the oat fields has also increased proportionately more than that of wheat and corn, and the price shows a less proportionate decline.

Fifty-Six Pages in this number and something worth reading on every one of them! The AMERICAN AGRICULTURIST gives its subscribers the full value of their money, many times over. How well this fact is appreciated is shown by the flood of subscriptions now pouring in, not only from every State and Territory, but from every country in the world where the English language is spoken.

The American Agricultural Society.—As we are going to press we are informed by President P. J. Berckmans that as the yellow fever has entirely disappeared from Florida, the next meeting of the Society will be held at Sanford, Florida, on Mar. 6, 7, and 8th. To judge from present indications it will be one of the most interesting and best attended meetings in the history of the Society. Circulars giving details of the arrangements will be issued in a few days.

Our New Cover Page.—How do you like it? Isn't it neat and doesn't it bring up pleasant suggestions and happy memories of country life, the old home and the old farm? We always mean to make the AMERICAN AGRICULTURIST typographically beautiful, so that it will be welcome and attractive for its good looks as well as the solid excellence of its contents.

Import and Export of Eggs.—The import of eggs to the United States, mostly from Canada, was 15,620,000 dozen in the last fiscal year and 13,936,000 for the fiscal year ending in 1887. It is noteworthy that the largest importation in each year was in the quarters ending December 31st, it being in each case considerably more than one-third of the total for the year. In each year, also, the importation for the quarter ending March 31st was, as might be expected, the least, and was less than 3 per cent of the total. The export of eggs for the two years was 419,701 dozen for the last fiscal year and 372,772 for the year preceding.

Killing Canada Thistles.—C. B. Rockwell, Hancock Co., Ill., writes: "The most successful way to kill Canada thistles in this locality, where the plants are much or fully grown, is to cut them even with the ground and then pour enough coal oil upon their roots to wet the ground down to four or six inches. A large root may require a good deal of oil. When plants are eight inches in height I usually put the oil directly upon them, wetting them thoroughly. Coal oil is cheap and is sure death to all such plants."

Forcing Bees into Surplus Boxes.—Jasper Blines, Clark Co., Mo., writes us: "My experience with bees teaches me that they should not be disturbed by smoke or any other annoyance. I place the boxes on the hive and remove them when filled, without arousing the colony at all. Bees, like all other domestic stock, should be treated kindly. If they do not enter surplus boxes, they have not filled the hive below, or else there is a deficiency in the supply of honey to be collected."

Barb Wire Fence.—M. R. Moore, Logan Co., Ark., writes us: "Has the plan of putting the third or fourth bottom wires of a wire fence on the *inside* of the inclosure ever been tried? I never saw it, though it may be done. If the bottom wires were put on the inside and the top wires on the outside the fence would be better braced, and the strip of ground between posts would be turned over to the cattle instead of being saved for foul weeds, etc., yet there would be no particular danger of the wires being pushed off. 'Twould permit setting two wires farther apart."

AMERICAN AGRICULTURIST
FOUNDED IN 1842

JANUARY, 1889.

A New Departure.

A more profitable return for the farmers' labor is the universal want in the world of agriculture. Since the prices of his products are in one sense beyond his control, the most practical way to make his labor more profitable is to make it more productive. Without discussing the merits of intensive or extensive farming, it goes without question that a majority of farmers do not begin to get the yields per acre that they might secure with a comparatively small outlay of money and work above what they now expend on small or unprofitable crops. Oftentimes it costs no more, per acre, to raise a good crop than simply a fair one, because the work is done so much better in a different way from the system usually pursued. So confident are we that this is generally the case that we want to create a new departure among farmers that shall make this new year the most profitable they have ever known. The AMERICAN AGRICULTURIST, therefore, offers the following prizes (payable in gold coin) to stimulate better farming among its subscribers in the United States and Canada:

FIVE HUNDRED DOLLARS for the largest yield of shelled CORN on one measured acre.
FIVE HUNDRED DOLLARS for the largest yield of WHEAT on one measured acre.
FIVE HUNDRED DOLLARS for the largest yield of OATS on one measured acre.
FIVE HUNDRED DOLLARS for the largest yield of POTATOES on one measured acre.

Numerous other prizes will be contributed by live stock breeders and by manufacturers of agricultural implements, fertilizers and other articles indispensable to farmers, while not a few public spirited citizens not engaged directly in the agricultural trade are co-operating earnestly with us in this matter, so that the complete list of premiums in the AMERICAN AGRICULTURIST Prize Crop Competition is expected to aggregate Five Thousand Dollars. Some of the details of this remarkable contest are published in full on Page VI of the present issue.

This effort to stimulate profitable agriculture is undertaken on a scale that will arrest the attention of farmers throughout the world. While the prizes offered are unprecedented in amount, the fact that not less than one measured acre of each crop must be grown is a condition that will win general support for the enterprise, and insure competition for the prizes among farmers everywhere. The small plat has small place in practical farming, though it may have a certain value for scientific experimenters. But our great staple crops, upon which the generality of farmers depend, must be grown by the acre and must yield largely if practical farming is to pay a profit to the men engaged in it. To encourage these men—the vast army of farmers who depend on farming for their living—the AMERICAN AGRICULTURIST and its progressive friends offer these liberal prizes.

What possibilities this enterprise opens to the American or Canadian farmer! What mortgages may be paid off with the prizes to be secured! What improvements will these prizes enable the fortunate competitors to make! How many farmers will secure valuable and long-wished for implements or improved stock, or a season's supply of fertilizers! Above all, what crops will be produced! What a revelation the experiences of so many good farmers in all parts of the United States and Canada will be to the class who now feel that they are already doing as well as they can! The reports of the prize winners and other contestants should prove a most instructive lesson in practical agriculture. The contest should inspire new interest and enthusiasm among the farmers of two nations. Let it be discussed wherever farmers meet. Spread far and wide the news of the great prizes. Compete in every county and in every township for the rich rewards, and when the harvest is garnered let the results of the AMERICAN AGRICULTURIST Prize Crop Competition be seen in yields that shall prove not only richly remunerative to the men who grew them but a grand incentive to progressive farmers everywhere.

The Live Stock Trade of 1888.

A careful survey of the cattle trade from January 1, 1888, to November 30, 1888, reveals a varied condition replete with losses which need not have been incurred. Our Eastern markets have been liberally supplied with meats; the dressed beef trade has assumed large proportions and has to a great extent crowded out the live stock dealers. The losses we speak of were due to a want of foresight on the part of shippers who blindly forward stock, not knowing the needs of the market they wish to supply. Trade in beeves suffered all through the year from the poor quality of the cattle offered. During October and November even fair quality steers were scarce, and good quality, well fattened, ripe beeves were unknown. The export demand at the port of New York, though moderate as to numbers, was sufficient to take all that ranged above fair. This left local slaughterers no other way of escape than to ship direct from great Western centers of live stock business. This means of obtaining the excellence of quality required for the best grade of our local butcher traffic is growing, day after day. These through shipments injure the interests of the cattle growers of Virginia, Ohio and Kentucky, and also seriously lower the profits of those engaged in New York State and Pennsylvania in fattening cattle. The cattle owners of the States named are responsible for their own losses in that they have not given to our Eastern markets the class of beeves which suited the requirements of the trade of the great cities. In forwarding immature herds, shippers forget that all incidental expenses are alike, whether they send a car load of runts which will sell at two and one-half cents, or a car load of ripe corn or meal-fed steers which will bring the top rate of the market.

Prices for the past eleven months have been low, but so has been the quality of the offerings. The highest quotations of these months are: March 19th, 11¼ cents; June 25th, 11½ cents; July 30th, 11⅝ cents; August 13th, 11¾ cents. Prices then steadily declined until November 25th, when the top price was 10½ cents, a recovery in value which had sunk to 9⅞ cents on several market days, and more than once 9½ cents represented the top price. In noteworthy opposition to this condition of trade was the fact that on November 19th the heaviest run of sheep and lambs recorded for years came to hand; still, as the quality was suited to the needs of buyers, the offerings were accepted and sheep remained steady in value. Lambs, many flocks of which were of indifferent quality, went off a quarter of a cent a pound.

Grass-fed herds in this land of cereals are a grand mistake, because they dress to small profit. The choice portions of the carcasses are light, and the quality is inferior. The beef never commands the attention of the best class of buyers and it serves in consequence to divert trade to other articles. In the large cities game is now rapidly taking the place of old-time succulent roasts and juicy steaks.

A Great and Growing Evil.

Adulteration is rampant. It is not confined to our own country but is prevalent throughout the world. The progress of our so-called civilization seems to be measured by adulteration. The recent Congressional investigations into the adulteration of lard, and the illegitimate sale of oleomargarine as butter, have done much to bring public attention face to face with this great evil. It appears that there is scarcely an article of food that is not adulterated to a greater or less extent, except the great staple crops like wheat and corn which are so cheap that it is impossible to find a less expensive medium with which to "extend" them. We find this fraud perpetrated in other lines, but food adulteration is its worst form. While a gross outrage on the consumer, this adulteration is a still greater wrong to the farmers, for they are both food producers and food consumers. Adulteration swindles and injures the farmer's stomach and also defrauds his pocket-book. The farmers, therefore, doubly need to seek protection from this dishonest competition.

The effects of the prevalent mania for food adulteration are daily growing in intensity. The honest butter and lard and other products of our farms are depressed in value in our home markets because adulterated or compounded products sell under the same names at lower prices. The effect on the foreign market is likely to be still more pronounced. England, for instance, is already agitating the exclusion of American lard, and American cheese has to be shipped via Montreal and sold as the Canadian product to command the highest market. France and Germany have long prohibited our pork products on the groundless charge of being diseased. For the protection of the foreign outlet for our surplus, as well as for the other reasons above given, this country must at once take a position that will guarantee the purity of its food staples both at home and abroad.

Several bills having this object in view were introduced at the first session of the present Congress. A substitute measure known as the Laird bill, and numbered

11,266 on the House calendar, was finally reported from the Committee on Agriculture. It establishes a Pure Food Division in the Department of Agriculture, with an appropriation of $250,000 for its work. The bill provides for the inspection of cattle about to be slaughtered and of products manufactured therefrom that are intended for inter-state or foreign trade; the healthy are to bear the government stamp to that effect, and such articles not so stamped are forbidden in inter-state commerce. No adulterated or compound foods injurious to health, or drugs weakened in quality or potency, will be admitted from foreign countries or from one State or Territory to another. Compound foods must bear a distinct statement of their composition, into which no harmful ingredient may enter. Penalties for violating the act are provided, and United States district attorneys are charged with its enforcement. Publication of analyses of all foods and drugs is required, which analyses any citizen may secure free of charge upon stated conditions. Nothing in the act shall be construed as interfering with the national oleomargarine law.

Some such measure as this, enforced with vigilance and intelligence, would do much to stop the abuses of which we complain. The government brand on our exports would become a synonym for purity and standard quality in American food products. Such a system of inspection would doubtless so enhance the standing of our products abroad as to enable them to command sufficiently higher prices to return our producers many times the cost of the proposed system. The application of the same principle to our inter-state commerce, the proper branding of food compounds and the prohibition of harmful mixtures, would also have a powerful and beneficial influence.

Although imperfect in important details, the Laird bill aims at the right principle. We trust that our readers, so far as their influence can reach will insist that Congress perfect this measure and enact a statute that shall thoroughly cover the ground. Special provision should be made to induce the respective States to coöperate in carrying out the great work of suppressing food adulteration. A few States have already made good beginnings in this direction, but since the reform within State lines is wholly a matter of State control, an active public sentiment in its behalf needs to be felt in our Legislatures as well as in Congress. No effective legislation may be expected, however, until American farmers demand it. The general public is notoriously inactive in such matters. Farmers, who suffer most seriously, have the remedy in their own hands. Let them persist in demanding reform until Congress grants it. But the reform should come in the simplest manner. The less complex and the less expensive its operation, the better.

Women as Scientists.

The recent appointment of a woman to the position of assistant mycologist in the Department of Agriculture at Washington suggests a field of employment hitherto almost untried by the gentler sex. The natural sciences are rapidly becoming recognized as practical sciences in their relation to agriculture. Botany, chemistry, entomology, geology, ornithology, will all be important agencies in directing the agriculture of the future. At present these branches are not overcrowded with competent workers, and some of them, such as botany, with its inclusive branches of mycology and vegetable pathology; and entomology, with its study of insect enemies to vegetation, seem peculiarly fitted for women. One of the highest of our entomological authorities is a woman; another woman is perhaps the leading critical writer upon architecture and landscape gardening, both of which are related to agriculture in its highest sense. Further evidence that the field of the natural sciences is not overfull is the recent statement of the chemist of the Bureau of Agriculture that, in event of the manufacture of sorghum sugar becoming commercially practicable, more people will be immediately needed for the scientific work connected therewith than the whole number who are now competent and available.

Live Stock Judges at Fairs.

So much injustice has often been committed by judges of live stock at fairs that many breeders have refused for years past to exhibit their animals. The prizes have frequently been given to the fattest animals, regardless of their pedigree, breeding, proper harmony and superiority of points, and especially their anatomy. Unless the appointed judges are practically well acquainted with the breed of each animal submitted to their award, they are incapable of deciding aright. To obtain fair judgments as to the merits of animals, let the society of each breed of animals appoint the judges. A man may be an excellent breeder and judge as to the points of a Shorthorn, but indifferent as to a Hereford, Sussex, Devon, or Scotch Polled. Few, even of the best and most experienced cattle breeders of one particular sort, are capable of judging correctly as to all breeds of cattle.

A butcher may pass upon the carcass of fatted cattle, for he has only one thing before him to decide upon, namely, the quality of the meat. But for animals to be slaughtered two classes of judges ought to be appointed to award two different kinds of prizes; one for the animal alive, embracing its breeding, economy of growth and superiority of form, the other for the quality and due proportion of dressed meat to its live weight. Occasionally one animal may be quite superior to another in living style, fine points, and harmony of form, yet inferior as to its flesh. Still this is not often the case; and in purchasing for slaughter it is usually better to choose animals that are the most perfect in living form rather than such as are indifferent, at the same time avoiding those of too much floating fat under the skin and those of blubber-like appearance.

It has been the rule quite generally hereto fore to appoint two or three judges to award prizes. In the former case, if the two could not agree, they called in a third to decide between them; but latterly, in several instances, only one judge has been appointed, and his decisions have given quite as much satisfaction as those of the two or three. This is more economical for the society, as the judges should be well paid for their services, and then a superior class of men can be obtained.

Self-Help the Best Help.

State aid to agriculture is commendable when properly administered. We fear, however, that there is a growing and too common tendency to call for public appropriations for carrying on work which farmers should do themselves. We see the same thing in the demand for the enactment of laws to regulate matters which can only be efficiently righted by a widespread, energetic and popular public sentiment. The AMERICAN AGRICULTURIST is keenly alive to the fact that the National and State governments owe an important duty to the agricultural interests, but we are also firmly convinced that farmers owe a duty to themselves. Self-help is always effectual. What we learn by our own effort is always of more value to us and has a greater influence on the public welfare than similar knowledge gained through assistance from the State. Let us not run to the Legislature or to Congress until we have done our whole work as farmers and as citizens in behalf of desired reforms or improvements. State appropriations to agricultural societies, for instance, are of small value if the farmers who comprise these societies do not take an active interest in the welfare of their organizations. Indeed, an independent society composed of active, earnest, public-spirited farmers generally does far more for the promotion of agriculture than state-aided institutions. So, too, we find in those States where the Patrons of Husbandry are most progressive, that the farmers in this organization are doing, through their own efforts, a work which eclipses, in practical value, the generality of results attained through organizations that receive State aid. We must not permit favors from the public treasury to sap our individuality, earnestness or public spirit.

Where Reform is Needed.

The annual exhibition of live stock and kindred interests at Chicago, known as the Fat Stock Show, has become too important a feature of American farming to be discontinued or mismanaged. It is too much to expect a combined fat stock, dairy, breeding stock, poultry and horse show, to be conducted by the board of agriculture of a single State, if it is to represent the whole country as fairly as it should and is presumed to do. A volunteer organization, or a corporation composed of men of national repute in the live stock and dairy industries, should be organized to manage this exhibition on a scale commensurate with the interests it represents. In this way the enterprise can be made profitable both to its backers and to this important branch of husbandry. But the new management should insure the show against the insidious and deleterious influences that might otherwise be associated with it. The start that has already been made in behalf of a National Dairy Show indicates that the live stock and dairymen of America are ready for this reform. With the advantages which Chicago can offer a national and liberal management, and with past experience to profit by, there are enough brains, business and capital engaged in our dairy stock and kindred industries to make the exhibition unrivaled in character, practically above criticism, of lasting value as an educator, and at the same time financially profitable.

TO HELP THE FARMERS.

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Rocks and Soils.*

This volume, as stated in the preface, is intended as a treatise on chemical geology for students in agricultural colleges. It is divided into three parts—geology, fifty-eight pages; rock composition and decomposition, sixty-four pages, about evenly divided between the two topics; while ninety-two pages are given to the subject of soils and their relations to plants. This allotment of space evidently presupposes the absence of a separate course of geology in an institution using the book, and if it be judged with this understanding it must be considered as fulfilling acceptably the purposes of a compend of geology and rock formation for such cases. The treatment is plain and concise. The third division of the work is not well balanced. Eighteen pages devoted to a presentation of Prof. Levi Stockbridge's experiments on the formation of dew, and his doubtless correct theory of the process, appear disproportionate when compared with the cursory discussion of the mechanical and chemical composition of soils. The latter follows almost exclusively the lines laid down in the old world, and (with the exception above noted) ignores completely the labors of American investigators, as well as the subject matter treated by them. The old Nobel's apparatus and its unreliable and practically incorrect results are alone referred to in treating of physical soil analysis. Chemical soil analysis is not only dismissed in the most summary manner as useless, but in the tables of the appendix the examples given are of the oldest, in which not even the alkalies were determined separately from the earths; not a single example of an American soil is given. As a sequel to the undisputed maxim that the "greatest good is not to be derived from the *mere* study of soil composition" (the italics are ours), the author practically discards that study entirely, and confines his recommendations to the analysis of crops alone. He thus quite definitely claims that the chemical nature of soils, so far as chemistry can ascertain it, is a matter of indifference to the agriculturist—a rather daring proposition at the present time.

The definition of lime soils as "soils containing under fifty per cent of lime;" of salt soil, as being "like the alkaline plains of Arizona," which are stated to be "rendered fertile by irrigation;" of clay soils as containing sixty per cent and over of clay, and many similarly inaccurate statements can hardly pass muster as good authority in this country, where Adolph Mayer's one-sided experiments and conclusions do not go unchallenged. One cannot but regret that this latest issue from the American press should be content with echoing the ideas and teachings of old-world investigators, many of whom have worked under conditions of local practice and climate which they neglected to consider as accidental, and with whom the staple refrain is too commonly a contemptuous belittling of the labors and views of Liebig. Whatever may have been the errors of Liebig as to facts which he had not had time to ascertain, he stands and will ever stand serenely above the majority of his critics in the broadness of his conceptions and in his readiness to admit errors whenever fairly demonstrated. In the latter particular especially, Adolph Mayer and others working on his plane stand very much in need of a return to the sound scientific methods of the father of agricultural chemistry. The tables at the end of the volume (apart from that of soil composition, above noted) are well selected and form a convenient source for the data commonly needed in a course of agricultural chemistry.

*ROCKS AND SOILS: Their Origin, Composition and Characteristics. Chemical, Geological and Agricultural. By H. E. Stockbridge; 214 pp. text, and 13 pp. tables of analyses of agricultural materials. John Wiley & Sons, 1888.

Notes from the Stations.

Warming water for beef cattle during spring (March) weather proved quite harmful at the Minnesota station, even when compared with the results of giving ice-cold water. Prof. Porter says: "This still further illustrates the point that warming water in any other than very cold weather does not pay, and may even do harm for beef cattle at least." He calls attention to the absence of authentic facts as to the advantages of warming water for stock at any time, and purposes to test the matter this winter thoroughly.

During the last twenty-five years the working staff at Rothamsted, Eng., in addition to Sir John Lawes and Dr. J. H. Gilbert, has consisted of two and sometimes three chemists, two or three general assistants in charge of field experiments, a botanist with from three to six boys under him, three and sometimes four computers and record-keepers, and two laboratory men. Much chemical work has also been done under the same auspices in London and elsewhere. This will give some idea of the extent of this famous agricultural experiment station, wholly maintained by Sir John Lawes, who has endowed it with half a million dollars to insure its continuance upon his decease.

Spaying heifers is intelligently considered by Dr. Paquin in Bulletin 3 from the Missouri station. He gives an illustrated description of the operation, which, however, should only be attempted by experts. Dr. Paquin is convinced that spaying will pay well, especially in the Middle and Western States. He points out that while scrub bulls are now castrated and converted into profitable steer beef, scrub heifers are permitted to perpetuate their kind and add to the already large surplus of scrub stock. Spaying heifers would diminish the production of scrub stock and transform the animals operated upon into valuable beasts for the beef market. The experiments so far conducted lead Dr. Paquin to state that not one heifer in two hundred will die under the operation, if properly done, and that they will bring as much money as steers at similar ages. This bulletin should be studied by every stock man.

The tenth annual report of the North Carolina experiment station shows that this station has been largely devoted to fertilizer work, not only inspecting numerous manufactured fertilizers, but doing much to develop the natural resources of fertility in the State, in the shape of marls, limestones and phosphates, besides teaching the best ways of utilizing composts, cotton-seed products and other sources of fertility on the farm. This is not original work, but it is exceedingly useful. The signal service reports occupy unnecessarily extended space. The average farmer will also complain at the extent of the discussion of the temperature of the soil, but we believe our stations must study the soil itself more in the future than in the past. Little has yet been done in field work, as the station farm was acquired only a year since. A good index and a list of the publications of the station from its inception add to the value of the report, which will be sent free to any of our readers who will write to Raleigh, N. C., for it. The station workers are H. B. Battle, Ph. D., director; Milton Whitney, farm superintendent; Baldwin Von Herff, Ph. D., Frank B. Dancy, A. B., W. A. Withers, A. M., and F. B. Carpenter, B. S., assistant chemists; H. McP. Baldwin, meteorologist. The station receives the whole of the Hatch fund.

Prof. W. O. Atwater has been placed at the head of the Experiment Station Division of the Department of Agriculture. This is a strong appointment, and Commissioner Colman is fortunate in having been able to secure so competent a scientist. This appointment is made to carry out the spirit of national supervision and co-operation between the various stations contemplated in the language of the Hatch act: "That in order to secure, as far as practicable, uniformity of methods and results in the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of results of investigation or experiments; to indicate, from time to time, such lines of inquiry as to him shall seem most important; and, in general, to furnish such advice and assistance as will best promote the purposes of this act." There is a great work to be done here if the utmost benefit and least waste of money and effort are to result from the liberal appropriations under the Hatch law. It will at once restrain any tendency to divert the station funds from their proper sphere. President Cleveland said on this point in his last message to Congress: "A supervision of the endowed experiment station system recently provided for is a proper function of the Department and is now in operation. This supervision is very important and should be wisely and vigilantly directed to the end that the pecuniary aid of the government in favor of intelligent agriculture should be so applied as to result in the general good and to the benefit of all our people, thus justifying the appropriations made from the public treasury."

PUBLICATIONS RECEIVED.

ALABAMA—Experiment station at Auburn, Bul. 1, January, 8 pp., experiments with corn; B. 2, 22 pp., experiments with wheat, cabbage, tomatoes, cantaloupes and watermelons, and analyses of fertilizers, with an article on the woods of Alabama.

COLORADO—Experiment station at Fort Collins, Bul. 5, 12 pp., report of experiments in apiary.

CONNECTICUT—Storrs School Experiment station at Storrs, Bul. 2, October, experiments on the effects of tillage on soil moisture.

DAKOTA—Experiment station at Brookings, Bul. 5, October, 16 pp., garden notes, including experiments with varieties of cabbage and celery.

DELAWARE—Experiment station at Newark, Bul. 1, June, 8 pp., objects and organization.

ILLINOIS—Transactions of the State Horticultural Society for 1887, 340 pp., including short articles on growing and keeping sweet potatoes, the manufacture of cider and other vinegar, and birds and insects—which to kill and which to protect, also on mulching apple trees.

INDIANA—Transactions of the American Horticultural Society for 1888, 358 pp., including articles on the educational needs of the American farmer, our neglected native fruits, value of arsenic as an addition to kerosene emulsion, and an appendix of 124 pp. on a sixty-days tour beyond the Sierras.—Report State Board of Agriculture, 510 pp., including proceedings of the Indiana Shorthorn, Jersey and swine breeders' associations, wool growers' and bee-keepers'.—Experiment station at LaFayette, Bul. 15, June, 14 pp., concerning the potato tuber.

KANSAS—Experiment station at Manhattan, Bul. 4, September, 8 pp., experiments with wheat relative to hardiness, chinch bugs, with and without manures and fall feeding.

LOUISIANA—Department of Agriculture at Baton Rouge, Circular No. 4, series of 1888, 14 pp., crop report for July, August and September, same for November. Experiment station at Baton Rouge Bul. 16, 16 pp., potatoes, tomatoes, peas and small grains; B. 17, 16 pp., ensilage. B. 18, 26 pp., analyses of commercial fertilizers.

MAINE—Experiment station at Orono, Bul. 25, August, 8 pp., fertilizer analyses and valuation; B. 26, October, 16 pp., composition and digestibility of hay and coarse fodder ascertained by original experiments.

MARYLAND—Experiment station at Agricultural College, Bul. 2, September, 16 pp., cutting seed potatoes for planting, and an appendix of information about the station.

MASSACHUSETTS—State Experiment station at Amherst, Bul. 31, 16 pp., fertilizer analyses including the new act to regulate the sale of fertilizers; pamphlet of 4 pp., November, analyses of commercial fertilizers.

MICHIGAN—Experiment station at Agricultural College, Bul. 42, 10 pp., experimental work among horses.

MINNESOTA—Second biennial report State dairy commissioner, 350 pp., 7 plates, containing analyses of different cheeses, and milk tested at the farmers' institute meetings and at creameries.

MISSISSIPPI—Experiment station at Agricultural College, Bul. 4, November, 8 pp., the marls of Mississippi.

NEW JERSEY—Experiment station at New Brunswick, Bul. 49, November, 20 pp., analyses and valuations of fertilizers and chemicals.

OHIO—Proceedings of the ninth annual meeting of the society for the promotion of agricultural science, 102 pp.

PENNSYLVANIA—First annual report of the Experiment station at State College, Centre county, for the year 1887, embracing field experiments with various crops and fertilizers, the amount of digestible food furnished per acre in various fodder crops, the composition and digestibility of corn stover, and meteorological record; Bul. 5, 12 pp., digestibility of soiling rye.

UNITED STATES DEPARTMENT OF AGRICULTURE at Washington, D. C.—Annual report for 1887, 742 pp., 100 plates, including the following reports of chiefs of divisions which are also published separately: Entomologist, 178 pp., 8 plates; chemist, 220 pp.; botanist, 122 pp., 27 plates; section of vegetable pathology, 74 pp., 26 plates; ornithologist and mammalogist, 56 pp., 1 plate; bureau of animal industry, 75 pp., 4 plates; statistician, 80 pp., 8 diagrams; pomologist, 24 pp., 9 plates.

Division of Economic Ornithology—Bul. 2, report on Bird Migration in 1884 and 1885, by W. W. Cooke, 312 pp., with a map of the Mississippi valley, showing the stations of the observers of bird migration under the American ornithologists' union.

Division of Chemistry—Bul. 19, 94 pp., methods of analysis of commercial fertilizers, cattle foods, dairy products, sugar and fermented liquors adopted at the fifth annual convention of the association of official agricultural chemists held at the United States Department of Agriculture Aug. 9 and 10, 1888.

Statistical Division—Crop reports for each month, from No. 47 in January to No. 58 in December. No. 49 is on distribution and consumption of grains. No. 53 gives a comprehensive account of agriculture in Australasia.

Botanical Division—Bul. 5, 110 pp., 25 illus., experiments made in 1877 in the treatment of the downy mildew and the black-rot of the grapevine; B. 6, 120 pp., 30 illus., an investigation of the grasses of the arid districts of Texas, New Mexico, Arizona, Nevada and Utah, in 1887; B. 7, 30 pp., black-rot.

Entomological Division—Nos. 1 to 6 of *Insect Life*; Bul. 11, 34 pp., experiments with various substances on insects affecting garden crops; No. 19, 78 pp., an enumeration of the published synopses, catalogues, and lists of North American insects.

Forestry Division—Bul. 2, 252 pp., 1 large map, forest conditions of the Rocky Mountains and other papers.

Division of Pomology—Bul. 1, 146 pp., the condition of tropical and semi-tropical fruits in the United States in 1887, 3 plates; B. 2 on the adaptation of Russian and other fruits in the "Cold North."

VERMONT—Tenth agricultural report by the State board of agriculture for 1887-8, 404 pp., 10 illustrations, with an article on grasses by A. W. Cheever, and one on the inducements Vermont offers for farmers' homes.

WISCONSIN—Experiment station at Madison, Bul. 17, November, 26 pp., report on corn, oats, barley and potatoes, and an article on grape-growing and the station vineyard, by W. A. Henry, with three full-page illustrations.

ENGLAND—Memoranda of 38 pp., of the origin, plan and results from 1837 up to June, 1888, of the field and other experiments conducted on the farm and in the laboratory of Sir John Bennet Lawes at Rothamsted, Herts; also a statement of the present and previous cropping, etc., of the arable land not under experiment; replete with tables.

See other acknowledgments in previous issues.

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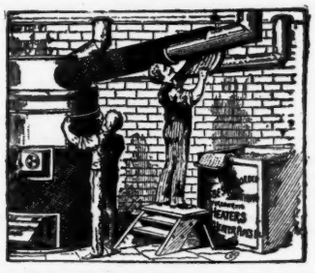

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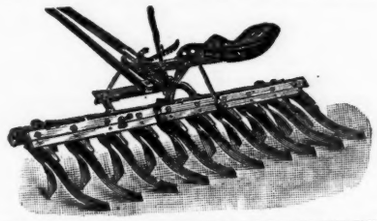

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The Live Stock Show and Meetings.

The American Fat Stock Show at Chicago in November was favored with fairly good attendance and satisfactory weather. The horse display was the leading feature, although there was a creditable array of fat cattle and of breeding stock and poultry, but the dairy show was almost boycotted because of the admission of oleomargarine and butterine, which products were shown in every conceivable way calculated to deceive the public as to the nature of these compounds. Some fault was found on account of the selection of alleged incompetent persons to act as judges, it being claimed that local butchers were appointed on the score of economy in place of men possessing a broader experience. A large number of the associations of registered stock breeders held their annual meetings during the show, the principal transactions at which are epitomized below:

The American Shorthorn Breeders' Association received reports of officers and committees, showing a gain of $7,000 during the past year. President, Emery Cobb, of Kankakee, Ill.; secretary, J. H. Pickrell, of Chicago.

The National Swine Breeders' Association was addressed by Prof. W. A. Henry, of Wisconsin, on feeding for quality of meat, and by Prof. J. W. Sanborn, of Missouri, on swine feeding. Dr. Billings, of Nebraska, spoke on trichiniasis and swine plague, criticising the work done in this direction by the Department of Agriculture, and at his suggestion the association voted that the Commissioner of Agriculture should place the work of investigating swine diseases in the hands of an independent committee of three experts. President, D. L. Thomas, of Rushville, Ind.; secretary, P. M. Springer, of Springfield, Ill.

The American Lincoln Breeders' Record Association decided to offer special premiums for pens of Lincoln sheep at the next State fair. Secretary, L. C. Graham, of Cameron, Ill.

The American Leicester Record Association voted to offer special premiums for Leicester sheep at the next Illinois State Fair. Secretary, A. J. Temple, of Cameron, Ill.

The Victoria Swine Breeders' Association elected officers and directors. President, George F. Davis; secretary, Henry Davis, both of Dyer, Ind.

The Duroc-Jersey Swine Breeders' Association voted to reorganize and incorporate. President, Thomas Bennett, of Rossville, Ill.; secretary, S. E. Morton, of Camden, O.

The American Shropshire Sheep Breeders' Association decided to offer $100 premiums at the 1889 Fat Stock Show, also $100 at the Toronto Industrial Fair, 1889, and a £50 cup at Buffalo Fair, 1889. President, S. H. Todd, of Wakeman, O.; secretary, Mortimer Levering, of Lafayette, Ind.

The American Galloway Breeders' Association increased the number of shares to four hundred to accommodate its growing membership. President, David McCrae, of Guelph, Ont.; secretary, L. P. Muir, of Independence, Mo.

The American Clydesdale Association had $1,886 in the treasury. President, N. P. Clarke, of St. Cloud, Minn.; secretary, Charles F. Mills, Springfield, Ill.

The American Shire Horse Breeders' Association voted to arrange for a show in 1889. Secretary, Charles Burgess, Wenona, Ill.

The Cleveland Bay Society passed resolutions with reference to furnishing copies of the stud book to members and papers; also as to a design for medals. Secretary, R. F. Stericker, Springfield, Ill.

The American Association of Importers and Breeders of Belgian Draught Horses elected officers and heard reports. President, F. J. Jolidon, of Elvaston, Ill.; secretary, J. D. Conner, Jr., of Wabash, Ind.

The National Poland-China Association resolved to amend the standard by giving more weight to size, according to age, and refused to adopt a proposed resolution favoring judging by score cards. President, W. W. McClung, of Waterloo, Ill.; secretary, Carl Freigau, of Dayton, O.

The Red-Polled Cattle Club met at Chicago Nov. 15 and voted to incorporate. President, Gen. L. F. Ross, of Iowa City, Ia; secretary, J. C. Murray, of Maquoketa, Ia.

The French Coach Horse Association chose as President E. A. Powell, of Syracuse, N. Y.; secretary, S. D. Thompson, Wayne, Ill.

The Cotswold Association chose as president E. B. Emory, of Centreville, Md.; secretary, George Harding, of Waukesha, Wis.

The Illinois Shorthorn Breeders' Association resolved to employ an agent to travel about the State to educate farmers on the good points of Shorthorn cattle, bring breeders and buyers together and secure new members. President, S. E. Prather, of Springfield; treasurer, William Potts, of Jacksonville.

The Essex Swine Association adopted a scale of points and re-elected Frank Wilson and E. F. Doney, of Jackson, Mich., and Patrick Millett, of Fowlerville, Mich., directors; President, W. J. Neely, of Ottawa, Ill.; secretary, W. M. Wiley, of New Augusta, Ind.

The Consolidated Cattle Growers' Association elected Maj. W. A. Towers, of Kansas City, as president. It resolved to ask Congress to enact that all railroads shall transport southern cattle from one State to another between March 1 and Dec. 1 of each year only in cars that are labeled plainly for the transportation of cattle south of the thirty-sixth parallel of north latitude, and that they shall be yarded and fed only in yards separate from northern cattle, and that no northern cattle shall be admitted to these cars or pens between March and December unless same has been thoroughly disinfected. It also resolved in favor of enacting a national inspection law making it unlawful to transport from one State to another, or to any foreign country, any food meat which has not been inspected alive by a United States Inspector and found healthy, and that the Department of Agriculture should create such bureau for this purpose. It was also resolved to approve the exhibition of animal products of the United States at the International Exposition in Paris in 1889; also suggesting that the National Cattle Growers' Association should continue a system of tests relating to the contagiousness and dissemination of Texas fever; indorsing the exhibit to be made by the new National Dairymen's Association in 1889.

The Western Circuit of State Fairs recommended that the Iowa and Ohio State Fairs be held during the first week in September; Nebraska, Minnesota and Tri-State the second week in September; Wisconsin, Kansas and Indiana the third week in September; Illinois the fourth week in September; St. Louis Fair the first week in October.

The American Percheron Horse Breeders' Association received reports showing that 3,240 had been registered since the publication of the last volume of the stud book. R. B. Kellogg, of Green Bay, Wis., was elected treasurer, and Evans & Blewitt, of Fremont, Neb., were expelled for selling horses on false pedigrees.

The new American Dairymen and Breeders' Association appointed a committee to confer with various breeders' and dairy associations and the Produce Exchange to arrange for a dairy exhibit, it being claimed that the State Board of Agriculture and the managers of the Fat Stock show failed to give the dairy proper prominence. It was the sense of the committee that the exhibit should be held at the time of the Fat Stock show next fall.

Over thirty Holstein-Friesian breeders, representing nearly every State in the Union, received a report recommending the offering of prizes for Holstein-Friesian cattle at the proposed dairy fair. Thomas B. Wales, of Iowa City, Ia.; Jerry Allis of Isinours, Minn., and A. E. Powell, of Syracuse, N. Y., were appointed to take charge of the matter.

The State Veterinary Association elected as president, W. L. Williams, of Bloomington, Ill.; secretary, S. S. Baker, of Chicago; treasurer, John Scott, of Bloomington, Ill.

The American Shetland Pony Club decided to admit Shetland ponies to its books. An exhibition is to be given in connection with the next Fat Stock show, $500 being set apart for prizes, registered animals only being allowed to compete. President, Charles P. Willard, of Chicago, Ill.; secretary, J. Murray Hoag, of Maquoketa, Ia.

Matters of Business.

Grinding Mills at the Alabama State Fair.—The Kelly Duplex Grinding Mill, manufactured by the Springfield Engine and Thresher Co., Springfield, Ohio, received at the recent Alabama State Fair held at Montgomery the first premium over all competitors including many well-known standard mills.

Quaker City Grinding Mills.—These mills manufactured by the Lagonda Manufacturing Co., of Springfield, Ohio, are peculiarly well adapted to farm use. When fed with ear corn, they crush the cob by a peculiar and ingenious arrangement, grinding grain and cob together. The feed is automatic; there is no choking the grinding plates, and the mills are built in a very durable and substantial manner.

The Golden Gate Special.—The Union and Central Pacific roads, and Pullman Company, put on, December 5, a weekly train of Pullman Vestibule Cars to run between Council Bluffs and San Francisco. Steam heat, electric light, separate bath rooms for ladies and gentlemen, barber shop, observation and smoking rooms, and a female attendant for ladies and children make it "The finest train in the World."

Scientific Grinding Mills.—These mills are especially built for grinding corn and cobs, as well as other food for stock. They will grind old or new corn with the husks on, and also cut straw or fodder without change in the mill. Farmers, planters and stock-feeders find them of great value, and convenience. The "Scientific" grinding mills are made by the Foos Manufacturing Co., of Springfield, Ohio.

No Home in any English-Speaking Country is without a library if it possesses a complete set of Charles Dickens's works. These charming books, replete with wit, humor and pathos, are always delightful to old and young. A rare opportunity for securing the complete works of Dickens is offered by the *American Magazine* in this issue of the AMERICAN AGRICULTURIST, and all our readers will do well to take advantage of it.

Lord Bacon's Idea of a Garden.—Bacon once said: "A garden is the purest of human pleasures. It is the greatest refreshment to the spirit of man." Any one who has looked through one of D. M. Ferry & Co.'s Seed Annuals for this year will agree with him. It is brimful of information, profusely illustrated, and contains everything pertaining to the planting and care of seeds. Send to the firm's address at Detroit, Michigan, and they will forward a copy.

To Numerous Inquirers in reference to suits on patents of Spring Tooth Harrows, manufactured by A. H. Stevens & Son, Auburn, N. Y. The above firm guarantees all purchasers against any royalty claims made by competing houses, or their agents: Messrs. Stevens & Son are an old and trustworthy firm, and amply able to protect all their customers. Our readers need fear nothing from purchasing or using harrows made and sold by them or their legal representatives.

Farming Lands in Colorado.—The Platte Land Co., limited, of Denver, Col., is a substantial corporation which has carried out an extensive system of redeeming the arid lands in that State by means of irrigation. Its main canal was constructed at a cost of nearly three-quarters of a million dollars and supplies water sufficient to irrigate fifty thousand acres. The company offers for sale its lands in the immediate vicinity of Denver at reasonable prices and on easy terms of payment.

"The Cup That Cheers."—Consumers of teas and coffees will do well to notice the advertisement of the Great American Tea Company, 31 and 33 Vesey street, New York, which appears in our advertising pages. This concern has been before the public for the last thirty years and during that time has sold untold tons of tea and coffee, not to speak of the articles of utility and beauty which it has given away to its patrons. The company imports directly, and thus saves the profits of middlemen.

A Healthful Beverage.—Cocoa is one of the most comforting, healthful and invigorating drinks used by civilized people, invaluable for invalids and agreeable to all. Its use becomes more extended every year, as its value and desirability are recognized, and its cost (less than one cent a cup) makes it as economical as it is pleasant. It is more generally used at breakfast, as is indicated by the name of the standard preparation, Walter Baker & Co.'s Breakfast Cocoa; but it is equally desirable at other times, and always nourishing and palatable. Its increased consumption is an encouraging sign of the popular tendency to healthful rather than injurious drinks

Planting Potatoes by Machinery.—The Aspinwall Potato Planter is a practical machine that will rapidly do the work which heretofore has been slowly and tediously done by hand labor. The machine will plant from five to eight acres per day, attended by one man and team, and do work better than is ordinarily done by hand, from the fact that the planter deposits seed (either cut or whole) in a straight row of uniform depth and covers the seed with moist earth. This planter met with great success last season, and our readers who are interested in potato culture should see the illustrated circular of this implement which gives a full and detailed description. Write to the Aspinwall Manufacturing Company, Three Rivers, Mich.

High Judicial Authority.—Hon. Melville W. Fuller, Chief-Justice of the United States, says: "I have used and relied on Webster's Unabridged Dictionary for many years and entirely concur in the general commendation it has received." Hon. Morrison R. Waite, late Chief-Justice of the United States, says: "Webster's Unabridged is recognized as standard authority in the court over which I preside, and its usefulness increases as the successive editions appear." The Lord Chief-Justice of England, in his decision of the famous Alexandra case, says: "I have looked, so that I might not go wrong, at Webster's American Dictionary, a work of the greatest learning, research and ability."

A Farm Steamer.—The latest and best invention in the way of steamers for farm use is the Austin Steam Generator. It is useful not only for cooking and steaming feed, but can also be adapted to a great variety of uses about a farm. It will heat water for the slaughtering, boil water for the laundry and make a great saving in the labor of rubbing, cook fruit, heat water for the bath room, sweat tobacco, renovate feathers, etc., etc.

The Austin Steamer is made entirely of steel plate, provided with a safety valve, will burn either coal, wood or cobs, is furnished with a patent filling tank and also with an automatic filler. It is manufactured by F. G. Austin Mfg. Co., Chicago, Ill., and is for sale by Messrs. Goulds & Austin, 167 and 169 Lake St., Chicago, Ill.

Good Threshing Machine.—The Fearless threshing machines and horse powers made by the Empire Agricultural Works, of Cobleskill, N. Y., possess many features of superior excellence. The railway horse powers have a patent governor and speed regulator, by means of which a steady motion is maintained, and they work equably, smoothly, and with the least possible waste of power. By a very slow and easy movement of the horses a sufficient speed is obtained. The threshers are, when desired, furnished with a dust-flue which is a great relief to the operator. The mechanical construction of both thresher and power is of the best kind. Their merits are attested by gold medals and other prizes now in sharp competition with other machines.

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DIAMOND DYES

Superior IN Strength, Fastness, Beauty, AND Simplicity.

Warranted to color more goods than any other dyes ever made, and to give more brilliant and durable colors. Ask for the *Diamond*, and take no other; 36 colors, 10 cts. each.
WELLS, RICHARDSON & CO., Burlington, Vt.

For Gilding or Bronzing Fancy Articles USE
DIAMOND PAINTS.
Gold, Silver, Bronze, Copper. Only 10 cts.

W.R&CO'S IMPROVED BUTTER COLOR

EXCELS IN STRENGTH PURITY BRIGHTNESS
SOLD EVERYWHERE. MORE OF IT USED than of all other makes combined. Send for our valuable circulars.
WELLS, RICHARDSON & CO., Burlington, Vt.

"The SCIENTIFIC GRINDING MILL," manufactured by THE FOOS MFG. CO., of Springfield, O., was awarded the highest and only medal on grinding mills at the Cincinnati Centennial, just closed, as the following correspondence conclusively proves.

Office of THE FOOS MFG. CO.,
SPRINGFIELD, O., Nov. 10. 1888.

E. O. ESHELBY, Secretary,
CENTENNIAL EXPOSITION, Cincinnati, O.

Dear Sir—One of our competitors having published statements to the effect that they received an award for the best grinding mill at the Centennial Exposition, will you kindly, in the interest of "Truth," inform us to whom said medal was given, and oblige,

Yours, very respectfully,
THE FOOS MFG. CO.

CENTENNIAL OF OHIO VALLEY AND CENTRAL STATES,
CINCINNATI, O., Nov. 10th, 1888.

THE FOOS MFG. CO., SPRINGFIELD, O.

Gentlemen:—Replying to yours of even date, will say, that the ONLY award made on Grinding Mill was to THE FOOS MFG. CO., of Springfield, O. Silver Medal.

Very respectfully,
E. O. ESHELBY, SECRETARY.

LEVI C. GOODALE, CHAIRMAN on R. J. & A.

CIDER MACHINERY
Knuckle Joint & Screw Presses, Graters, Elevators, Pumps, etc. Send for Catalogue
Boomer & Boschert Press Co. 216 W. Water St. Syracuse, N.Y

THE STATUS OF THE
KELLY DUPLEX GRINDING MILL
at the CINCINNATI CENTENNIAL.

Read the following, then
COMMENT will be UNNECESSARY
as this letter is from the **original Committee,** composed of the following thoroughly practical and unbiased gentlemen: Joseph R. Brown, Chairman, (of the well-known Commission firm of J. R. Brown & Co., Cincinnati); Chas. Hoefinghoff (of the Hoefinghoff & Laue Foundry Co., Cincinnati); and G. G. Palmer, (of the House & Palmer Co., Millers, Lockland).

The undersigned, the Jurors selected for Class 1, Group 2, at the Centennial Exposition, at Cincinnati, having on the 9th day of October, 1888, after due notice to all parties interested, made a careful and thorough test and examination of all Feed Mills entered at said Exposition, on the same day prepared and filed with the Commissioners, our report, unanimously awarding **FIRST PREMIUM, SILVER MEDAL,** to the **KELLY DUPLEX FEED MILL,** manufactured by The Springfield Engine & Thresher Co., of Springfield, O. A protest having been filed by representatives of contesting mills not receiving the award, (on the grounds, as we are advised, that the Mill we examined and awarded the premium to was not the mill originally entered for competition, but another or new and improved mill), we were requested by the chairman of the committee to make a second examination, but after frequent efforts to get together without success, we finally met, but concluded **our award was correct** as made, and refused to make any further examination, and sent our resignation to the Commissioners, our examination being sufficiently thorough to convince us that we could not reach a different conclusion.

Joseph R. Brown, Chairman
Chas. Hoefinghoff
G. G. Palmer
Committee Class 1, Group 2.

The names of the committee whose signatures are signed to this communication should be sufficient, but there seems to be a question raised as to our receiving this award. ***To settle this question for all time to come,*** we publish the above over their signatures. A fac-simile of their letter will be mailed to all interested parties.

SPRINGFIELD ENGINE & THRESHER CO., SPRINGFIELD, O.

ESTABLISHED JAN. 1st, 1866.
PATENT WATER PROOFED
NO TAR
FAY'S MANILLA ROOFING.
CHEAP STRONG WATER PROOF, Applied by our New Patent method with ⅓ the labor of any other way. Unlike any other roof. No rust or rattle. An Economical and DURABLE SUBSTITUTE for PLASTER on walls. Ornamental CARPETS and RUGS of same material, cheaper and better than Oil Cloths. ☞Catalogue and Samples Free.
W. H. FAY & CO. CAMDEN, N.J.

PIANOS FROM $150 to $1500. UNIVERSITY ORGANS FROM $35 to $500.
Famous for Beauty, Sweetness, Durability. No Agents. Sent from factory direct to purchaser. You save the enormous expenses of agents. Guaranteed six years, and sent for trial in your own home. VICTORIOUS for 80 YEARS. Catalogue free.
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IS THE ACT OF
FLOWING WATER
over lands, to
NOURISH CROPS.
Fine Farming Lands
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Under good
Irrigation Ditches,
And only 40 miles from the great and growing
CITY OF DENVER,
(POPULATION 100,000.)
are for sale on long credit including
RIGHTS TO WATER
At $20 to $25 per acre,
BY
The Platte Land Co.
S. J. GILMORE, MANAGER,
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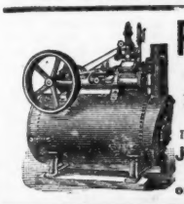
cooper's Broad Rib Roofing,
Made from Tin and Steel Plate. For public and private buildings, barns and outhouses. Absolutely rain, storm and fire proof, easily applied, artistic in finish, without any exceptions the BEST IN THE WORLD; catalogues free. Address NATIONAL SHEET METAL ROOFING CO., 509 East 20th St., New York City. Mention this paper.

THE PERKINS'
Wind Mill
is the Strongest and Best Self-Regulating Wind Mill made. Full instructions for erecting sent with the first mill. All Wind Mills warranted. For Circulars and Prices address
The Perkins' Wind Mill & Ax Co.
Agents wanted. Mishawaka, Ind.

DARNELL'S PATENT FURROWER & MARKER

Cannot be choked
Runs Steadily.
Adjustable Runners and Marker.
Gauge adjustable to all inequalities of ground
Opens a better row in either soft or hard ground than any other Marker.
Send for CIRCULAR

Leaves the earth well pulverized at bottom of furrow. Marks any width from 2½ to 5 feet, and from a mere mark to 6 inches deep.
"Take pleasure in recommending it. It does the business; is well made and will last for years." *J. S. Collins, Moorestown, N.J.*
"It far exceeds my expectations. If the real merits of this cheap implement were known to potato growers alone, the sales would be immense." *E'L. Coy, Pres. Wash. Co. (N.Y.) Agr. Society*
H. W. DOUGHTEN Manufact'r. Moorestown, Burlington Co., N. J.



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This is the QUAKER CITY GRINDING MILL
Agents wanted in unoccupied territory
which beat the Best Grinding Mill on Earth and the Best Grinding Mill made, at the Pennsylvania State Fair, September, 1887. It sells rapidly where all others fail to satisfy. For grinding CORN, COB and SHUCKS and all kinds of GRAIN it has no equal.
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Hooks for Conviction.
Points On Which to Hang Your Faith.

Facts for stepping stones:

You cross the ford of doubt easily then.

Twenty years ago Dr. Geo. R. Starkey introduced the COMPOUND OXYGEN TREATMENT into general use.

Since then it has cured thousands.

Here are all these years of growth implying development and success; for anything that lives so long and has good prospects of years more shows several things.

I. It is established on a solid basis.

II. It has the essentials of growth, soundness, genuineness.

III. It has had developing care—it has developed.

IV. It is exactly what it is asserted to be.

With all these facts in view DR. G. E. PALEN, a physician of skill and wide experience joined DR. STARKEY in his effort to secure for the COMPOUND OXYGEN TREATMENT the popular recognition to which it was entitled.

This was not so difficult to do.

For DR. STARKEY in addition to his skill, was enthusiasm itself.

DR. PALEN was enthusiasm and resource; for he devoted to the development of this treatment all his time and his entire fortune.

This heartiness and unity of action had a natural result:

THE COMPOUND OXYGEN TREATMENT grew into general use and to-day there are thousands who gratefully testify to its power.

They bear living witness to the fact that it is a positive and permanent way to get well.

It is also a delightful one.

For THE COMPOUND OXYGEN TREATMENT is characterized by that soothing, kindly effectiveness that distinguishes sympathetic kindness from professional cruelty.

Drs. STARKEY & PALEN do not consider it necessary to torture nature into a spasm in order to effect an ultimate cure.

Power is not necessarily divorced from grace and ease.

Caesar was a dandy in his youth.

But you always get force with kindliness when you get 'near to nature's heart'; and to inhale this soothing, beneficent curative is to get as 'near as nature's heart' as it is in the power of man to conduct you.

That it is kindly, and that it does remove disease, observe the following testimony from those who have used it.

"I want to tell you how your Texas asthmatic is getting along. I am just as well at this date as when I gave you my testimonial in 1886. I do feel so thankful to you and to the Giver of all good for the blessed health I enjoy.
MRS. MARY HARGROVE.
Crafton, Wise Co., Texas, May 7, 1888."

"I do not know how to thank you enough for the benefit I have received from Compound Oxygen.
MRS. J. L. COURTNEY,
Aiken, S. C."

"About three years ago I had a severe attack of asthma, and was weak and worn-out for loss of sleep. I dismissed my physician, as his remedies gave me no relief, and commenced the Home Treatment of Compound Oxygen, using no other remedy, *and it cured me.* I am eighty years old. GEO. L. DOUGLAS,
Louisville, Ky., Oct. 1888."

"I take pleasure in stating that my daughter, who for almost all her life has suffered from bronchial asthma, has received decided benefit from the Compound Oxygen Treatment of Drs. Starkey & Palen, of Philadelphia. The benefit received in her case warrants me in saying to sufferers in a similar way that they would do well to investigate for themselves. JOHN J. MASON, M.D.
Columbus, Ga., August 13, 1888."

"I can cheerfully give my testimony to the efficacy of your COMPOUND OXYGEN. I am happy to inform you that I am much improved since I last wrote you. I have not had any asthma. I have had quite a bad cold in my head, which I expected would end in an attack of asthma, which it has done for twenty-seven years; but, thanks to your treatment, I am quite restored. I am a wonder to myself and friends. MRS. T. N. AVERY.
Peekskill, Westchester Co., N. Y., Sept. 29, 1888."

"How any one can get along without the Inhaler is more than I can imagine. When having asthma it relieves me very much, if it never does anything more for me. I stick to it twice every day. I have you to thank that I am as well as I am, for every one who knew how bad my asthma was when I began the COMPOUND OXYGEN says that I could not have lived three months without help, and the doctors failed to help me in any way.
MRS. EUNICE ROBBINS.
Canaseraga, N. Y., August 13, 1888."

"If I were asked to give an opinion of COMPOUND OXYGEN I feel that I would be taken at a disadvantage, since I confess I do not comprehend how such things can be. However, the bare facts are these: My husband undertook the COMPOUND OXYGEN TREATMENT in order to find relief from asthma; at the same time he was a sufferer from malaria, dyspepsia, gout, and kindred ailments. In a short time not only the asthma, but those other ills associated with it, disappeared, and to-day he is a well man—so well, indeed, that he scarcely realizes the pleasant truth. We do not hesitate to indorse the COMPOUND OXYGEN TREATMENT. MRS. J. W. WINGATE.
1507 Race street, Phila., Pa., Sept. 3, 1888."

If you want to know more about the COMPOUND OXYGEN TREATMENT, send to DRS. STARKEY & PALEN for their brochure of 200 pages and their quarterly review entitled *Health and Life.* They will be forwarded to any address, free of charge. These publications contain the record of result in COMPOUND OXYGEN TREATMENT in cases of consumption, bronchitis, asthma, catarrh, dyspepsia, nervous prostration, rheumatism, neuralgia, debility, and all chronic and nervous disorders. Or, if you ever come to Philadelphia, call and see them. Address DRS. STARKEY & PALEN, No. 1529 Arch street, Philadelphia, Pa.

II.

Many are curious to know exactly what Drs. Starkey & Palen mean by consultation, to which, in addition to whatever supplementary aid is required, they say each purchaser of their treatment is entitled.

This is briefly told.

Drs. Starkey & Palen begin by knowing all about your case.

That is to say: You tell your troubles and describe the surrounding circumstances, which anybody is able to do, personally or by mail, and they go to work intelligently to see if their Compound Oxygen fits your case.

If it does they will tell you so.

If it does not they will be equally candid.

They much prefer to tell you beforehand if, in their judgment, the treatment will *not* do you good than to have you discover this afterward.

Their success is due to this candor.

Their reputation depends upon it.

However, when you consider the nature of their treatment—that it is inhaled in a breath; absorbed by the blood; hurried to every hungry nerve and vessel by the quickened circulation; and that from its very blood-making character it is so instantly and wholesomely appropriated, then

You will understand why it is so generally successful, and why this supplementary aid is so seldom required.

This system of reporting which they have established with each purchaser of their treatment is precisely the relation of physician and patient.

That its results are good you may judge by the indorsements accompanying this paper.

Moreover, as has been intimated, there is no extra charge for this consultation, for while the treatment lasts—which is usually from two and a half to three months—it is gladly and willingly given.

There is enthusiasm enough in the following extracts to encourage the most morbid.

"I used one Home Treatment of the Compound Oxygen and was very much benefited by it, and take pleasure in recommending it to all persons troubled with bronchitis or nervousness. REV. J. T. LYON,
N. C. Conference.
Laurinburg, N. C., May 29, 1888."

"I have used Compound Oxygen with great benefit. I think it is the only rational treatment for bronchitis and all throat and lung troubles. ALICE R. KIDD.
Batavia, Ohio."

"Compound Oxygen has benefited me.
WM. H. PROUDFIT.
No. 33 Main St., Jamestown, N. Y., June 30, 1888."

"Compound Oxygen has helped me wonderfully.
MRS. J. A. MCCRONE.
823 South Front St., Harrisburgh, Pa., Oct. 10, 1888."

"I feel that the Home Treatment is doing me great good. In fact I am confident that it invigorates every function. REV. J. B. WHALING.
Lead City, Dak., April 24, 1888."

"I have been very much benefited in a case of catarrh by the use of Compound Oxygen. WESLEY MILLER.
Shell Creek, Carter Co., Tenn., Oct. 9, 1888."

"I took one Treatment of Compound Oxygen last year, and it cured me of catarrh. W. W. DOWLING.
Toleston, Lake Co., Ind."

"Compound Oxygen benefited me greatly in a case of chronic bronchitis. I think it is a great remedy for suffering humanity. MRS. L. V. HEICHERT.
Frankfort, Ind., Sept. 19, 1888."

If you want to know more about the Compound Oxygen Treatment, send to Drs. Starkey and Palen for their brochure of 200 pages and their quarterly review entitled *Health and Life*, they will be forwarded to any address free of charge. These publications contain the record of result in Compound Oxygen Treatment in cases of consumption, bronchitis, asthma, catarrh, dyspepsia, nervous prostration, rheumatism, neuralgia, debility and all chronic and nervous disorders, or if you ever come to Philadelphia, call and see them. Address DRS. STARKEY & PALEN, No. 1529 Arch Street, Philadelphia, Pa.

III.

The question is asked, "since the Compound Oxygen Treatment is so powerful in itself, what need is there of this supplementary aid?"

As a rule—there is no need whatever.

DRS. STARKEY & PALEN cover most of the exigencies of disease with their Compound Oxygen Treatment. But you might ask some long headed man, "since it is only the wind that is blowing who do you carry an umbrella?"

In the first instance, the fact that DRS. STARKEY & PALEN do not expect all who have catarrh, for example, to have it alike; that they foresee the possibility of the presence of other aggravating causes, and are prepared to overcome these as well, should be downright evidence that they are in earnest; that they treat your malady to cure it, nothing less.

Their Compound Oxygen Treatment overcomes these in nearly every case, because it is so essentially a revitalizer.

Which means that Compound Oxygen helps nature, and nature responds by helping you.

But success implies obstacle—that is, obstacle overcome.

So DRS. STARKEY & PALEN intend that their Treatment shall have an unobstructed course.

If these other disorders persist in retarding its beneficent action—then DRS. STARKEY & PALEN persist in removing them.

This is the whole thing in a nutshell.

It explains why DRS. STARKEY & PALEN insist on knowing all about your troubles to begin with, and in having regular reports from each patient during the course of treatment.

It isn't long before there is no case to consider, for your disorders vanish and a well man has other things to think of.

The pleasure of recovery—for one thing.

Moreover, every patient of DRS. STARKEY & PALEN is entitled to this supplementary aid and consultation by mail or otherwise, free of charge.

It works well; it is a successful combination.

Disease can't stand against it.

Here are witnesses to the truth of this statement.

"I used Compound Oxygen four years ago for nervous prostration with good results.
MRS. GILBERT FREDERICK.
No. 125 Superior St., Ottawa, N. Y., Sept. 17, 1888."

"I most cordially recommend your Home Treatment to all persons suffering from nervous prostration or general debility, neuralgia, and sick headache; indeed, I would say, all chronic diseases. MRS. THOS. H. LEWIS.
Utica, Miss., July 18, 1888."

"I was induced by a friend to try your Compound Oxygen Treatment. The result was marvelous. I will always recommend Compound Oxygen as the greatest vitalizing agent known, for I certainly feel that it has prolonged my life. MRS. E. H. HENDERSON.
No. 331 Decatur St., Brooklyn, N. Y., June 4, 1888."

"Mrs. Crity, my daughter, has suffered very greatly from nervous prostration for nine years, and has lately been using the Compound Oxygen recommended by Judge Harris, of Athens, and has been very much benefited; mostly by being strengthened. S. P. RICHARDSON,
Presiding Elder of Athens District, N. G. Conference.
Athens, Ga., July 29, 1888."

"After using Compound Oxygen for eight weeks I am greatly improved in every respect; and, especially from nervousness. I also enjoy sweet refreshing sleep and have a good appetite, and my food agrees with me, and I feel that I am growing stronger daily. MRS. WM. H. JONES,
No. 109 Poppelton St., Baltimore, Md. Oct. 3, 1888."

If you want to know more about the compound Oxygen Treatment send to DRS. STARKEY & PALEN for their Brochure of 200 pages and their quarterly review entitled Health and Life—they will be forwarded to any address free of charge. These publications contain the record of result in Compound Oxygen Treatment in cases of Consumption, Bronchitis, Asthma, Catarrh, Dyspepsia, Nervous Prostration, Rheumatism, Neuralgia, Debility and all Chronic and Nervous Disorders. Or if you ever come to Philadelphia call and see them. Address DRS. STARKEY & PALEN, No. 1529 Arch St., Philadelphia, Pa.

A Weather Plant.

"Old Prob" might just as well retire from the weather business. Austria can tell just what the weather will be. She does it all with a plant, which with its tender and upper leaves can predict for three days, but when it feels real good, and tries its lower leaves, it can foretell eight days ahead. At first this plant made a great sensation, and all Vienna was in a state of excitement. The learned men, such as they were, could tell nothing about it, except it looked like an *Acacia*, and evidently belongs to the *Leguminosæ*. Crowds attended the exhibition of the plant, and even the Emperor went, and his Imperial Majesty purchased two plants, probably one for the Empress, so that she could have her own weather at the palace; and he paid over $30 each for them. At last accounts the plant had been ascertained to be an old and well-known one, *Abrus precatorius*, a native of the East Indies, since introduced in the West Indies, and very common there and in other tropical countries. It is a climbing plant with a root like that of liquorice, and is used for the same purpose. The plant is most noted for its seeds, which are egg-shaped, of a brilliant scarlet color, with a large black scar. In some countries they are called "Crab's Eyes." In India they are used as diamond weights under the name of *Rati*. They are strung and used as rosaries. Sailors, who often bring them home, call them "Black-eyed Susans." The seeds are used in various kinds of fancy work and are sold at stores where small shells and similar materials are sold. The art of foretelling the weather is a new property ascribed to the plant, but it is claimed by those who have it for sale that the plant has been subjected to thirty-two thousand trials, and has guessed right every time. Why, "Old Prob" is nowhere!

Employment at Home.

A lady subscriber at Washington, N. H., forwards to us a circular from a so-called "manufacturing company," of Boston. The circular sets forth that the "company" requires a large number of ladies and gentlemen to make a new style of picture, for which the company will furnish materials and instructions. It is stated that the work is so simple that "a child can do it after a week's trial." The "company" agrees to take all the finished work at a stipulated price, but "the nominal sum" of one dollar must in every case be first sent to the company "as a guarantee of good faith." The whole thing is a transparent scheme to wring hard earned dollars from those who can ill spare them. A moment's reflection will convince any person that there is no need of advertising an art so easily acquired. If the object is to obtain finished pictures at the price named, there would soon be enough made right in Boston to glut any possible market. The scheme is on a par with certain "art needlework" and similar projects for obtaining money under delusive promises of "employment at home." In fact, the locality and family resemblance of the affair suggest a common origin.

A Paper City.

Isaac Haupt, Centre Co., Pa., sends us a set of circulars and a map of the city of Marquand, Mo., the whole coming from the office of *The Mutual Helper*, which purports to issue from a town in Ohio. The alleged paper is $1.50 a year, and every subscriber is to receive as a premium a clear deed of a lot worth $50 in the aforesaid city. For five subscriptions seven lots, and for ten subscribers fifteen lots are promised. The "editor" is a certain Bain, whose name is not wholly unknown in connection with several schemes which have been shown up in these pages. If there are five men in Centre or any other county who will pay $7.50 in the expectation of each getting a good paper a year and $350 worth of city lots—well, they deserve to be swindled.

The London Dairy Show.

This important fair, held Oct. 9 to 12 inclusive, was, in many respects, the most complete of the kind ever held. The entries included two hundred and seventy-six cattle, thirty-five pigs, seventy-two goats, fifty-three milking trials, one hundred and seventy-six exhibits of cheese and two hundred and ninety-eight exhibits of butter, a total of nine hundred and ten, exclusive of one thousand six hundred and eight entries of poultry and a large array of implements and other articles not shown for premiums. The milking trials were extremely interesting. They were of two days' duration, each of the four milkings being weighed and analyzed, and the average of the mornings' and evenings' milk being taken. In judging, one point was allowed for each ten days since the third week from calving, this being reckoned as the natural shrinkage after a cow has reached a full flow. In the average daily product one point is given for every pound of milk, four points for every pound of solids other than fat and twenty points for each pound of fat. The average daily results were as follows:

DESCRIPTION OF COWS.	LBS. OF MILK.		PER CENT OF SOLIDS.				SCORE.
			TOTAL.		FAT.		
	M.	E.	M.	E.	M.	E.	
1 pure-bred Shorthorn.....	11.3	9.5	12 5	12.6	3.7	3.6	55
4 grade Shorthorns	26.9	22.3	12.5	13.5	3 4	4.4	112
Four Jerseys.....	17.9	16.7	14 2	14.9	4.8	5.6	89
Three Guernseys..	16.8	14.7	14.5	15 5	4.8	5.9	84
Two cross-bred....	23.3	21.4	12.6	13.2	3.5	4.3	102
Total averages ..	19.2	16.9	13.3	13.9	4 4	4.8	89

The pure bred Shorthorn was five years and eight months old and one hundred and forty-three days from her fourth calf; two of the grade Shorthorns were heifers, and the others eleven and six years old, and all had calved within two months. Two of the Jerseys were heifers and but lately calved, while the third was an eight-year-old cow two hundred and nineteen days from calf. One of the Guernsey heifers had just calved, the other had gone one hundred and eighty-one days, and the third was an old cow seventy-five days since sixth calf. The cross-bred cow that stood highest, scoring one hundred and twenty, was by a Shorthorn bull on a Holstein cow; she gave a large quantity of good milk, but her powers of maintaining her milk flow so long after calving were most notable. The other cow in this class, scoring eighty-three, was of an opposite cross—by a Holstein bull on a Shorthorn cow, but the quality of her milk was inferior; showing, in this case, that the sire had the greater influence in the quality of milk. The average shows that while the mornings' milking gave the greater quantity, the evenings' milk proved much richer in total solids and also in fat. The public butter-making contests were largely entered, and a woman won the championship.

A Misleading Experiment.

When bone meal is fed to cows, do the acids of digestion have a dissolving action on the phosphates similar to that of sulphuric acid, rendering the bone, after it has passed through the animal, immediately available for plant food? The Vermont experiment station answers this question in the affirmative, after one trial upon a three-year-old cow. The animal received a certain grain ration, the solid manure was carefully saved for five days, weighed and sampled for analysis. Half a pound of bone meal was then added to the feed twice a day, and after five days' feeding the solid manure was again saved for six days, weighed and sampled as before. As a result of a single analysis of the two manures, Director Cooke estimates that ten cows consuming ten pounds of bone meal daily would use up just a ton during the Vermont winter of 200 days, when their manure would contain 158 pounds of phosphoric acid as against 120 pounds of phosphoric acid in the manure of ten similar cows not fed bone meal. He figures that since the ton of bone meal would contain 420 pounds of phosphoric acid, the rest of that amount, or 382 pounds of phosphoric acid, would have been dissolved and would be found in the liquid portion of the manure in a form immediately available for plant growth.

A single analysis probably did not give the average composition. A close agreement of the analyses of duplicate samples would be required to give the results any probable value, and the urine should also be analyzed to serve as a check on the analysis of the solid excrement. Neither Voelcker nor Boussingault found phosphoric acid in the urine of the horse, cow or pig, although the drainings of dung heaps are known to contain considerable quantities of phosphoric acid, because it is so easily washed out of the solid portion by the liquid. With these facts in view, it cannot be assumed that all the phosphoric acid not found in the solid excrement was discharged in the urine. The inference is that there was an error in sampling or in the analysis. Very likely the solid portion sampled had been partially leached by the liquid. Neither, in estimating the feeding value of bone meal, is it "probably true that all of both the fat and protein are digested." Nor is the final statement warranted of $31 per ton as the feeding value of bone meal, and $42 as its fertilizing value after feeding.

The addition of a little fine ground bone to the cow's ration, either daily or quite frequently, is doubtless good practice, for what is not utilized in making milk of course goes into the manure. But to what extent the portion in the manure is rendered soluble by its passage through the cow does not seem to be indicated with any accuracy by this experiment.

Catalogues Acknowledged.

FROM SEEDSMEN, NURSERYMEN, ETC.

H. S. ANDERSON, Union Springs, N. Y.: Wholesale trade list of various fruit tree stock, ornamental tree seedlings, shrubs, fruit tree seeds, etc., also price list of Raffia.

BUSH & SON & MEISSNER, Bushberg, Mo.: Catalogue of hardy grapes; noteworthy for its concise and compact arrangement.

JOHN S. COLLINS, Moorestown, N. J.: Wholesale price list of small fruit, plants, grapes, fruit and ornamental trees and shrubs.

GREENE'S NURSERY CO., Rochester, N. Y.: Fruit guide and catalogue of plants, trees, shrubs, vines, etc., copiously illustrated, and full of valuable information to fruit growers.

FRED W. KELSEY, New York: Catalogue of specialties and novelties in trees, shrubs, roses, bulbs, etc.

HARLAN P. KELSEY, Highlands, N. C.: Price list of ornamental trees, shrubs and plants. Indigenous to the Southern Alleghany Mountains. Rhododendron Vaseyi a specialty.

LEWISTON SEED COMPANY, Lewiston, Idaho: "The Farmer's Grip Sack," a neat catalogue of field, garden and flower seeds, garden and orchard requisites, etc.

D. S. MYER & SON, Bridgeville, Del.: Circular and price list of the new Alberta peach.

H. SCHMITZ, Gand Belgium: Catalogue of seeds, bulbs, plants, implements, etc., in great variety. Very fully illustrated.

SELOVER & ATWOOD, Geneva, N. Y. Wholesale price list of fruit and ornamental trees, shrubs, etc.

J. M. THORBURN & CO, New York: Descriptive circular and price list of the new American seed potato, rural New Yorker No. 2.

WEBB & SONS, Wordsley, Stourbridge, Eng.: Catalogue of seed wheat, rye, barley, oats and other field seeds. A remarkably rich and varied collection; several colored plates.

J. P. WILLIAM & BROS., Heneratgoda, Ceylon, India: Catalogue of tropical seeds. An interesting and valuable pamphlet for all those living in tropical regions. Of tobacco alone there are forty varieties quoted, of Eucalyptus over thirty species.

MISCELLANEOUS.

JOHN S. CARTER, Syracuse, N. Y.: Catalogue, illustrative and descriptive of butter-making outfit, comprising creameries, churns, butter-workers, butter packages, etc.

CUMBERLAND COUNTY FERTILIZER COMPANY, Carlisle, Pa.: Circular of the Acme poultry food, also of fertilizers.

A. C. FARLEY & CO., Philadelphia, Pa.: List of attorneys in the United States and Canada, alphabetically arranged according to State, counties and towns; also the special laws of each State as to exemptions, interest, usury, limitation of actions, liens, etc.

HOWARD & MORSE, New York: Catalogue of iron and brass work, for the farm, garden, work shop, parlor, etc., richly and neatly gotten up.

LEHMAN, STERN & COMPANY, New Orleans, La.: A pamphlet describing the new Odenheimer cotton bagging, manufactured by the Lane mills.

JOHN P. LOVELL ARMS CO., Boston, Mass.: Wholesale price list of revolvers, rifles, guns and sporting goods of every description manufactured by this well-known company.

E. C. NEWTON, Batavia, Ill.: Descriptive and illustrated catalogue of improved cattle ties.

H. B. RICHARDS, Easton, Pa.: Descriptive and illustrated circular of Dutch belted cattle.

The National Horse Show.

The recent exhibition of the National Horse Show Association at Madison Square Garden, New York, must be regarded as a complete success. It is to be regretted, however, that the thorough-bred classes did not attract a greater display. The country that boasts the ownership of Iroquois and Foxhall should have been more widely represented. Bend Or, owned by A. J. Cassatt, again carried off the blue ribbon in his class, as a sire of hunters and useful classes. The class of coaching stallions had several entries, and was sharply contested. Drap d'Or, a dark chestnut of French birth, and a former first prize taker, was beaten by The Swell, a Yorkshire-bred horse imported into and still owned in Canada. The breeding of this foreign beauty is difficult to place accurately, for while he has the characteristic fore hand of the Cleveland Bay, his hind quarters and unusual compactness of build speak of a thorough-bred strain. The Swell is a faultless brougham or wheeler, as needed for single or double harness. Trotters were well represented, although the noted flyers of the age were not exhibited. That most beautiful of harness horses, Mambrino King, whose dark chestnut coat is smooth and soft as satin, and whose evenness of temper and rare intelligence admit of his being shown in the ring alone or in a crowd of other horses, governed by a slender cord passed over his under-jaw, was the admired of all still, in spite of his sixteen years so full of honors. This noble sire took the first prize in the class for trotting sires shown with four of his get. The cobs exhibited were a comely host. Little Wonder, in his class, "cob stallions," a frequent winner of blue ribbons, had to yield first honors to Fashion, a black cob and marvelously attractive. The Shetland ponies were beautiful enough to figure in a fairy masquerade; Dumpling, owned by Miss Consuelo Vanderbilt, carried off the blue rosette. The entries in heavy draught horses were few in number and so indifferent in quality as not to merit the approval of the judges. The Clydesdales also offered a most dreary prospect. So poor were the animals that no first prize was awarded, except to Goldseeker.

This Threshing-machine received the **highest** award of any at the Centennial Exhibition; the two last **Gold Medals** given by the New York State Agricultural Society; and has been selected from all others, and illustrated and described in that **great** work "Appleton's Cyclopedia of Applied Mechanics." Catalogue sent free. Address, **MINARD HARDER**, Cobleskill, Schoharie Co., N. Y.

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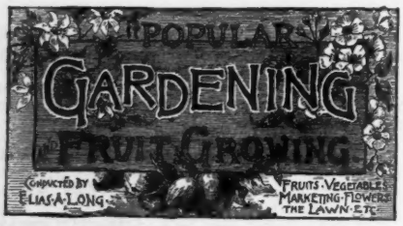

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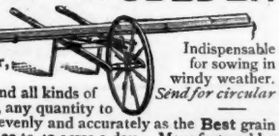

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Those are mistaken who think the shipping of frozen meat, especially mutton, from New Zealand, is not likely to have a serious effect on the English market. Nearly 200,000 sheep have been guaranteed to the Canterbury Frozen Meat Company for shipment to London during the season of 1889-90.

Johnson grass has been tried in several parts of Victoria, but is not approved when other and better fodder is obtainable. Our readers are familiar with the controversy over the merits of this grass in the Southern States, where many farmers regard it as a blessing, while perhaps an equal number look upon it as a curse.

The claim that Canadian cheese sold in English markets was seriously adulterated has been investigated by the government, which reports: "No admixture of foreign animal fat whatever takes place in the manufacture of Canadian cheese," of which 650,000 hundred weight are annually imported into Great Britain, forming one-third of its whole cheese supply.

Contrary to the prevalent notion in this country, which looks to Great Britain for thorough-bred registers of most of the breeds, there are only two varieties of sheep in Great Britain—the Shropshire and Suffolk Down—for which a flock book has been established, although the Oxford Down breeders have just started a registry and the South Down men will probably follow suit.

An enterprising Englishman has started a reform in the Singapore milk trade. He has established a dairy farm near the city, and supplies milk direct to consumers, after the system which some enterprising Americans have found profitable in the neighborhood of our large cities. The milk trade in many of the large foreign cities is in the same disorganized and unsatisfactory condition that prevails in America.

Vanilla is a jointed vine with a thick fleshy leaf, and flowers that require artificial fertilization. The fruit is a bean-pod, which, properly prepared, is the marketable commodity. Its native habitat is Central America, but it has been naturalized in the islands of Bourbon, Mauritius, and in Java, and is now being introduced into Fiji with success. It is also largely grown in Southern India and Burmah, where it forms a profitable crop.

In Ireland the government gives a premium for the best stallions at the annual horse show, but obliges the holders of the premiums to report at the end of the year the services of the horses and other points of interest in the improvement of the breed. Fifty mares are the limit of each stallion's service in one season and a strict selection of mares is required, so that during the past year only 754 out of 1743 mares submitted were accepted for service.

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Indian agriculture suffers greatly because of the general practice of killing cows, a practice peculiar to Mohamedans. A society has been formed to stop this practice, which has become so general that there is a scarcity of milk in many sections. It is believed that ninety per cent of the meat eaten in India is cow beef, whereas the contrary is the case in most other countries. Consequently the Indian oxen are diminishing in number, size and strength, and the production of manure is decreasing.

Southern Indian agriculture is so rude that the corn plant or maize has made but little progress, although introduced from the Southern States of America and from Queensland some years ago. Sorghum, however, especially *vulgare* is extensively grown, over thirty-one million acres being devoted to that crop. A fair yield of grain and of straw is always obtained, but the straw or stalks contain very little saccharine juice. The early amber variety, and *Sorghum saccharatum* or Chinese sugar cane are, however, quite rich, containing on the average 10 1-2 per cent of crystallizable sugar and 2 per cent of non-crystallizable sugar.

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The most important towns along the Sound are Olympia, Steilacoom, Tacoma, Seattle, LaConner, Port Townsend, Blakeley and a few others. All are supplied with excellent newspapers, schools and churches. The schools are supported with a liberality worthy of the highest praise. All children between the ages of eight and sixteen years are compelled by law to attend school three months in the year, and if their parents or guardians cannot pay for them, they are admitted free. All the time lost, through whatever cause, must be made up during the ensuing term or year, and the protectors of those children who do not comply with this provision are liable to a fine of $100. No books of a sectarian character are allowed in the schools, nor can any denominational doctrine be taught, and any school officer who knowingly admits the introduction of these is liable to a fine of $100. The schools are supported by a tax on all assessable property; by the interest on money obtained from the sale of school lands; and by fines imposed on violators of certain laws. Private academies may be found in every large town.

The lover of botany will find the vales and prairies of this region exceedingly attractive, for out of the four hundred species of flowers gathered in the Territory one hundred and fifty are indigenous to the prairies. The flora are distinguished by "loudness" of color, compared to their Eastern or European kindred, the most prominent hues being pink, crimson, white, yellow, red, lilac and purple. This brilliancy is probably due to an abundance of heat, moisture and light, and in some instances to a fertile soil. Modest blue is rarely seen; so it is evident that warm and abundant rains have a marked influence on color. Among the commonest flowers are the magnificent rhododendron, which assumes tree-like proportions, the lavender-hued edible camass, the omnipresent red-flowering currant, the mock orange, leontice, blue gentian, blue iris, larkspur, claytonia, leucanthemum, Carolina geranium, wild lily of the valley, montropia, or Indian pipe, yellow violet, helianthus, lupin, aster, Solomon seal, delphinum, œnethera, salvia, giloia, castilelja, æthusa, trelima, epilobium, or rose bay, and many others which are new to Eastern eyes and differ radically from their Atlantic cousins. The trees are principally gigantic conifers, the broad-leaved trees being comparatively scarce and unimportant. The largest lumber mills in the world are on Puget Sound, and more ship spars are exported from its shores than from all the remainder of the world.

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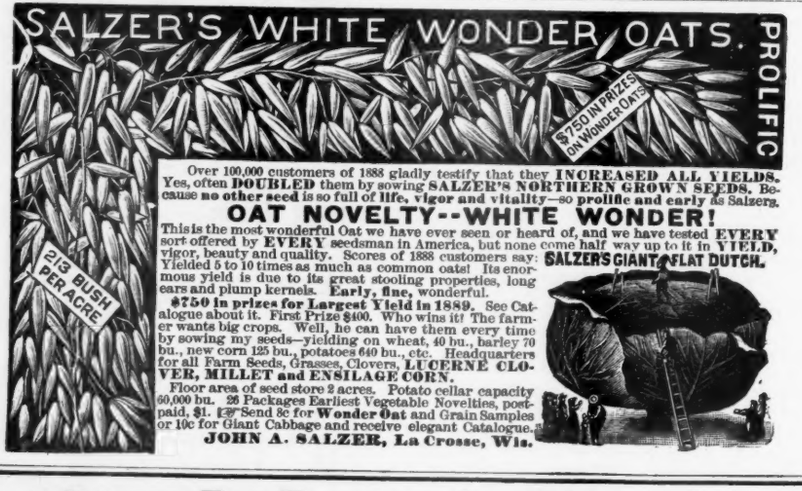

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